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JOURNAL OF EDUCATIONAL RESEARCH

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JOURNAL *of* EDUCATIONAL RESEARCH

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A STUDY OF THE PROCESS OF WORD DISCRIMINATION IN INDIVIDUALS BEGINNING TO READ

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THE specific aim of this experiment was to study analytically at the beginning level and in normal readers some types of errors in word discrimination that investigators have reported at various levels of reading attainment. It was further desired to set up the experiment in such a way as to eliminate some of the weaknesses in validity and reliability felt to be present in other experimentation in the field (7).

The plan of the experiment was (a) to construct word discrimination tests suitable for the beginning reading age level, (b) to administer these tests to a group of children before or at the start of their reading training, (c) to readminister them after the completion of from ten to fourteen weeks of training, and (d) to administer achievement tests at the close of the training period. Mental ages and intelligence quotients were obtained as subsidiary data.

Three groups of children were used as subjects in the experiment as shown in the following tabulation:

Group	Institution	Number Initial Tests	Re-Tests
First Grade	University Elementary School	28	28
Junior Primary	University Elementary School	35	25
Orphanage	State Orphans Home	24	24
Total		87	77

The first grade group was tested initially immediately following entrance into the first grade whereas the Junior Primary group was tested while in kindergarten during the spring previous to fall entry into the first grade. The orphanage group was given the initial tests within a month previous to their entrance into the first grade. The first grade and Junior Primary groups were retested during the eleventh and twelfth weeks of reading training. The orphanage group was allowed a somewhat longer training period since the children as a group were less used to the

school situation and of lower mentality, so that slower accomplishment was to be expected. They were retested after approximately fourteen weeks of reading training.

Mentally the orphanage group fell at the lower end of the distributions in both mental age and I.Q. but there was some overlapping and the distribution for the combined groups was fairly normal. The mean of the mental ages, 84.2 months, falls considerably above that set by Morphett and Washburne (12) and supported by others as prerequisite for learning to read, 76.0.

CONSTRUCTION OF THE DISCRIMINATION TESTS

In these tests it was desired to combine a broad sampling of possible confusions in word discrimination with a logical schema of those error types. To this end the following classifications and definitions were adopted.[1]

1. Cues tests: The test series designated cues contains tests in which the emphasis is upon the use of certain aspects of words as cues for the recognition of whole words. The test words are therefore alike in only one aspect. If confusions are made in such situations, the error must be due to the use of that aspect of the word as a cue for recognition of the whole. The factors which might be operating as inadequate cues tested here are: the beginning, the middle, the end, the beginning and end, the configuration of words, and additions or omissions. The configuration of a word is its geometrical shape. Thus in that test no letters were identical from word to word; only the shape of the whole was held constant. The additions or omissions category consists of words identical except for the addition or omission of a single letter. The additions and omissions were made in such a way as to change the configuration of the resultant word so that a cue other than that being tested for would not be introduced. The position in the words of the addition or omission was also systematically varied.

2. Details tests: The tests so designated really test cue confusions of a particularly complicated sort. Instead of holding one aspect of the words constant and so testing its influence on the recognition of the words, only one aspect of the words is varied and that aspect is a comparatively minute one. Thus confusions in these tests mean that the word has not been completely observed and the item overlooked may be systematically noted. There are three general types of situations in which discrimination is demanded in this series: (1) single letters are tested for discrimination in isolation; (2) word-like letter combinations with a single letter changed

[1] A more detailed statement of these conditions and of the experimental results is on file in the library of the State University of Iowa (8).

from word to word in such a way as to leave the configuration unchanged and in systematically varied positions (beginning, middle, and end) are presented; (3) words whose letter items and configuration remain constant while the order of the letters is changed about are tested. This last category is designated as mixed order and is introduced as a specific check on the false application of a disorientation explanation to this type of error. The type of situation in which the disorientation explanation would be possible is presented in the orientation tests as whole or partial word disorientation.

3. Orientation tests: In this test series the three confusing directions of disorientation or mirror-imaging in symbols are presented in three types of situations. The three directions are designated as vertical, horizontal, and diagonal. The three types of situations are single letter discriminations, discriminations between words in which only one letter is placed in a different orientation, complete or partial word disorientation. In the first two situations only those letters which cause confusion because they have the same geometrical shape but appear in different orientations are used as test letters: *p*, *q*, *b*, *d*, and *u* and *n*. These letters are not employed in any word tests in the other two large test series. In the last type of situation of this section of the tests these letters are also carefully avoided.

Three requirements arising from an analysis of earlier experimentation in the field (7) were involved in the testing technique.

1. Test material was needed that would test discrimination directly and yet would not be influenced directly by achievement factors.

Nonsense letter combinations were used instead of words.

2. There must be equal competition between all items included in a test.

This was insured by the use of a six item multiple choice situation with more than one correct item present. This meant that the child had to look at every word-like letter combination presented and make a discrimination for it. The cues and details test series contained two correct responses per test throughout whereas the orientation series contained three correct responses per test throughout. The tests from the various series were presented in chance order. Therefore, the children never knew how many correct items to expect and were again forced to discriminate for every item in the test. The positions of the correct items among the six for each test were varied.

3. The test items must be pure.

In other words the exact confusion occurring in an item from which the score is taken must be determinable within known limits. The description and definition of the test categories presented above suggested many of these internal controls. In summary they are: no identical elements other than those being tested for occur; the configuration is varied from

item to item except where it is specifically taken account of in scoring; no letters which cause confusion when disoriented are used except in the orientation tests themselves; there is systematic variation of the items being tested in each series from the point of view of position in the word; in the orientation tests there are an equal number of tests on each direction of disorientation. (Sample test items in the Appendix of this article demonstrate the application of these controls.)

SAMPLE TESTS

CUES[1]

Beginning (3 tests: 1, 2, and 3 letter cues)	Middle (2 tests: 1 and 2 letter cues)	End (3 tests: 1, 2, and 3 letter cues)	Beginning and End (1 test: 2 letter cues)	Addition and Omission (3 tests)
**therg*	**ake*	*feng*	*milt*	**ager*
thesw	**akg*	*stig*	*myrt*	*aer*
theml	*ckl*	*fenz*	**mawt*	*agher*
**athesw*	**akg*	**morg*	**mawt*	*aer*
therg	*ake*	**tig*	*myrt*	**ager*
theml	*ckl*	**morg*	*milt*	*agher*

DETAILS[2]

Single Letters (6 tests)	Single Letters in Word-Like Combinations (6 tests)		Mixed Order (3 tests)
j	*wyrk*	wyrk	*hifl
*k	*wyrk*	wyrk	fihl
j	*wyrh*	wyrh	*hifl
f	**wyrf*	**wyrf*	lifh
i	*wyrh*	wyrh	fihl
f	*wyrf*	wyrh	lifh

ORIENTATION[3]

Single Letters Disoriented (6 tests)	Single Letters in Word-Like Combinations Disoriented (6 tests)		Word Whole or Part Disoriented (3 tests)
(H) b	(D) *guk*	(H) *rimd*	(H)
*d	*guk*	*rimd*	*hekl
b	*guk*	*rimq*	hekl
*d	*guk*	*rimd*	
*d	*guk*	*rimq*	*hekl
b	*guk*	*rimq*	

[1]Samples indicate the type of cue being tested, i.e., the part of the item held constant; asterisks indicate the correct responses in each test; the cues themselves are indicated by italics.

[2]Samples indicate the type of situation presented; asterisks indicate the correct responses in each test; the varied detail is indicated by italics.

[3]Samples indicate the type of situation in which the effect of disorientation is tested; the direction of the disorientation is indicated by the signs: (V) vertical; (H) horizontal; (D) diagonal; asterisks indicate the correct responses in each test; the single letter whose orientation is varied is indicated by italics; configuration held constant except for changes necessitated by the disoriented letter.

The scoring was based upon the controls presented above and was the final step in the attempt at purity of testing. Only incorrect items chosen

as correct by the subjects were scored, since the correct responses may or may not have been chosen on the basis of adequate cues or correct orientation. Only when the child chooses an incorrect item may we be sure of the inadequacy of the cue he is using or the error in his discrimination between the directions of orientation.

CONSTRUCTION OF THE ACHIEVEMENT TESTS

A sampling of the actual reading material presented to the subjects of this study during their training period was made the basis of the achievement testing. Various sets of flash cards and certain regular blackboard notices and exercises formed the greater part of the early reading training for the first grade and Junior Primary groups. From a list of these, a representative sample of thirty items was taken for each group. The items were written in fairly large manuscript writing exactly comparable to that used in the actual flash card and blackboard exercises. A full verbal response was required and the number of items given correctly was the score. The orphanage group spent most of its training period on one primer (16). Each individual had had an approximately equal opportunity to learn the words used in the first eighty-three pages of this primer. A chance sampling of forty-four words was taken and made up into a photographic plate exactly reproducing the print used in the primer. The words were presented in isolation by means of a movable frame and verbal responses were required. The number correct was taken as the score.

MENTAL TESTS

Results of Stanford revision of the Binet-Simon intelligence test were available for all subjects with the exception of three in the orphanage group. These three children had been tested on the Kuhlmann revision of the scale only.

ADMINISTRATION OF THE TESTS

The first grade and Junior Primary groups were tested in testing rooms in their own school building during regular school hours. The orphanage testing was done in the kindergarten room of the school building on Fridays after school hours and on Saturdays.

Since it was not desired to test the factors of attention and memory at this time, a direct comparison was allowed between a card bearing the correct item and a test blank on the table. The card was presented in a small holder a few feet from the child's eyes and slightly above eye level.

It was large enough to be easily and clearly seen by any with at all normal eyesight. This technique made possible the testing of small groups of children. The size of the groups varied from not more than three during the Junior Primary and orphanage initial testing to not more than six in the first grade retests.

Three practice exercises were used for the first grade initial tests and for the retests of all groups. Three extra practice exercises were introduced for the orphanage and Junior Primary initial tests. The test series was so divided that from four to five or six group testing periods were attended by each child. The order of presentation of the test sheets was varied.

Cardboard "picture frames" were placed on the test blanks so that only one test or row of items showed at a time. The children were shown how to move these frames from test to test as the need arose.

In the presentation of the practice test series, the attention of the children was drawn to the separate squares appearing on the test blank. (The items were boxed in by single lines.) A card was placed in the holder and their attention called to it. They were then instructed to find a square on their papers that had something in it that looked "just like" what was on the card. When all had found and marked one, they were asked to look again at the card and then to look for another one like it in the same row on their papers. This continued until each child had ascertained for himself that there were no more in that row like the card. The frames were then moved to the next test and the above process repeated. Individual mistakes were corrected by the experimenter and it was pointed out that since the number of correct items varied from test to test they would never know how many correct ones there were going to be. Throughout the tests the experimenter occasionally reminded the children to be sure the ones they marked looked just like the card and to be sure to find all the ones that looked like it, but not to mark any that didn't look just like it. No time limit was used.

The achievement tests were all administered individually by the experimenter after the discrimination tests were completed.

ANALYSIS OF RESULTS

Reliability of the Discrimination Tests.—The internal consistency of the tests was determined by obtaining the Pearson product-moment coefficients of correlation between alternate tests for each of the three test series and for the whole battery. The reliability coefficients for each whole

series and for the whole battery were then determined by the application of the Spearman-Brown propheey formula. The resultant predicted reliabilities are shown in the following tabulation:

Test Series	Initial Tests	Retests
Cues	.958	.958
Details	.919	.857
Orientation	.942	.895
Total	.974	.937

Analysis of the Discrimination Tests: Gross Discriminative Abilities.—The frequency distributions for each of the three large sections of the tests and for the total scores on the initial tests and the retests are given in Table I. The gross discriminative abilities tested in this experiment

TABLE I

FREQUENCY DISTRIBUTIONS OF RAW SCORES ON DISCRIMINATION TESTS*

Class Interval	Cues		Details		Orientation		Class Interval	Total Scores	
	Initial	Re-test	Initial	Re-test	Initial	Re-test		Initial	Re-test
0 to 2	28 (37)	63	14 (16)	22	4	17	0 to 7	5 (6)	27
3 to 5	11 (12)	2	9 (12)	28	3 (5)	16	8 to 15	12 (15)	22
6 to 8	7	3	13 (17)	11	6 (7)	12	16 to 23	11 (14)	10
9 to 11	3	2	2	4	9 (11)	11	24 to 31	8 (10)	5
12 to 14	0	0	7 (8)	4	8	4	32 to 39	3 (4)	3
15 to 17	0	0	5	0	3 (6)	3	40 to 47	2	2
18 to 20	6	1	0	1	5 (6)	3	48 to 55	4	1
21 to 23	1	2	6	2	5	3	56 to 63	3	0
24 to 26	4	0	4	4	4 (5)	1	64 to 71	6	1
27 to 29	2	2	6	0	3	1	72 to 79	2	0
30 to 32	3	0	3	1	2	0	80 to 87	4	0
33 to 35	1	1	6	0	2	0	88 to 95	3	4
36 to 38	2	0	1	0	3	1	96 to 103	2	1
39 to 41	6	1	1	0	6	3	104 to 111	5	1
42 to 44	1	0	0	0	8	0	112 to 119	4	0
45 to 47	1	0	0	0	6	2	120 to 127	3	0
48 and above	1	0	0	0	0	0	128 to	0	0
Total	77 (87)	77	77 (87)	77	77 (87)	77		77 (87)	77
Mean	13.77	4.46	14.87	6.84	23.75	10.89		51.18	20.83
Standard Deviation	14.75	7.97	11.64	7.21	15.24	11.07		38.04	25.15

*Figures in parentheses show the initial test score distribution for the entire group given the initial tests while the other figures give the distribution only for those cases included in the retest group.

Test Series	Number	r	P. E.
Cues	77	.492	.058
Details	77	.667	.043
Orientation	77	.562	.052
Total	77	.640	.045

were not fully developed in these children just before or at the start of their reading training since no child made a perfect score. There was marked skewness, however.

The Pearson coefficients of correlation between the scores on the three test series tabulated below show a high degree of communality between the units.

Test Series	Number	r	P. E.
Cues and details	87	.899	.014
Details and orientation	87	.825	.024
Orientation and cues	87	.750	.031

The orientation test shows the greatest independence but the interrelationships still remain quite high.

The coefficients of correlation between the scores on the initial tests and the retests, however, are fairly low.

Evidently the individual patterns changed somewhat over the training period. The teaching method used with the subjects was of a rather diversified and individualized nature. Thus the patterns of confusions were probably subject to direct training influences which were not general for the group. The teachers were in no way aware of the types of situations on which their pupils were being tested for the experiment. It is, therefore, especially interesting to note that the intercorrelations among the scores for the separate test series are even higher for the retest scores than those derived from the initial test scores. They are shown in the following tabulation:

Error Scores	Number	r		P. E.
Cues and details	77	.862	±	.020
Details and orientation	77	.875	±	.017
Orientation and cues	77	.930	±	.017

These increases occur in spite of the reduced distribution of the retest scores. The generality of the confusions existing is more than ever apparent.

Analysis of the Discrimination Tests: Subtests.—The analyses of the subtests were made in terms of the percentages that the total number of errors made by all subjects in that test situation were of the total possible number of errors. Probable errors and the significance of the differences between certain percentages were calculated from the formula for the standard error of difference between relative frequencies in uncorrelated measures. Since the various subtests probably do possess some degree of correlation among themselves, the results of the formula used err from

TABLE II

SUBTEST ANALYSIS: SHOWING PERCENTS OF ERROR, PROBABLE ERROR OF PERCENTS, AND CRITICAL RATIOS FOR VARIOUS SITUATIONS

Test Situations	Percent of Error (1)*	Probable Error	Percent of Error (2)**	Probable Error	Critical Ratio
Initial Tests					
Cues Tests					
Beginning (1)* with middle (2)**	23.08	.88	13.22	.87	7.95
Beginning (1) with end (2)	23.08	.88	21.07	.86	1.63
End (1) with middle (2)	21.07	.86	13.22	.87	6.43
Beginning and end (1) with beginning (2)	29.02	1.64	23.08	.88	3.19
Beginning and end (1) with middle (2)	29.02	1.64	13.22	.87	8.49
Beginning and end (1) with end (2)	29.02	1.64	21.07	.86	4.30
Details and Cues Tests Combined					
Beginning (1) with end (2)	26.44	.72	23.62	.69	2.82
Beginning and end (1) with beginning (2)	35.73	1.00	26.44	.72	7.09
Beginning and end (1) with end (2)	35.73	1.00	23.62	.69	9.93
Details Tests					
Words (1) with letters (2)	32.66	.69	2.49	.23	34.99
Mixed order (1) with words (2)	41.86	1.03	32.66	.69	7.42
Orientation Tests					
Words (1) with letters (2)	52.62	.85	41.44	.84	9.99
Words (1) with whole or part (2)	52.62	.85	29.76	1.10	16.45
Letters (1) with whole or part (2)	41.44	.84	29.76	1.10	8.44
Orientation-Details Tests					
Letters: Orientation (1) with details (2)	41.44	.84	2.49	.23	44.72
Words: Orientation (1) with details (2)	52.62	.85	32.66	.69	18.21
Mixed order (1) with whole or part (2)	41.86	1.03	29.76	1.10	8.03
Directions of Disorientation: (Scoring according to Orton's theory)					
Horizontal (1) with vertical (2)	62.22	.90	43.75	.92	14.32
Horizontal (1) with diagonal (2)	62.22	.90	40.54	.92	16.81
Vertical (1) with diagonal (2)	43.75	.92	40.54	.92	2.47
Retests					
Cues Tests					
Beginning (1) with middle (2)	7.57	.57	3.57	.51	5.63
Beginning (1) with end (2)	7.57	.57	5.74	.52	2.32
End (1) with middle (2)	5.74	.52	3.57	.51	2.97
Beginning and end (1) with beginning (2)	8.12	1.05	7.57	.57	.46
Beginning and end (1) with middle (2)	8.12	1.05	3.57	.51	3.80
Beginning and end (1) with end (2)	8.12	1.05	5.74	.52	2.03
Retests					
Details and Cues Tests Combined					
Beginning (1) with end (2)	11.56	.55	7.47	.52	5.38
Beginning and end (1) with beginning (2)	11.90	.71	11.56	.55	.38
Beginning and end (1) with end (2)	11.90	.71	7.47	.52	5.03
Details Tests					
Words (1) with letters (2)	13.80	.54	.22	.07	8.76
Mixed order (1) with words (2)	24.89	.96	13.80	.54	10.08
Orientation Tests					
Words (1) with letters (2)	26.91	.80	15.51	.66	10.99
Words (1) with whole or part (2)	26.91	.80	14.66	.91	10.11
Letters (1) with whole or part (2)	15.51	.66	14.66	.91	.76
Orientation-Details Tests					
Letters: Orientation (1) with details (2)	15.51	.66	.22	.07	23.04
Words: Orientation (1) with details (2)	26.91	.80	13.80	.54	7.37
Mixed order (1) with whole or part (2)	24.89	.96	14.66	.91	7.73
Directions of Disorientation: (Scoring according to Orton's theory)					
Horizontal (1) with vertical (2)	30.13	.91	19.74	.79	11.07
Horizontal (1) with diagonal (2)	30.13	.91	15.24	.71	15.26
Vertical (1) with diagonal (2)	19.74	.79	15.24	.71	3.98

*(1) refers to (1) under Test Situations
**(2) refers to (2) under Test Situations

the actual facts on the conservative side. These data are presented in Table II. The data for subtests not used for critical ratio comparisons are placed in the summary discussion of the data given below. It is believed that the comparisons made between relative frequencies of error in the various test situations are valid because of the care that was taken in constructing the tests to equate the situations for various factors.

The initial pattern showed the characteristics listed below:

1. As compared with the middle, the beginnings and ends of words were most frequently observed and used as cues.

2. The middle section of the words was seldom observed and therefore gave rise to most errors.

3. Single nonreversible letters were discriminated quite adequately when presented in isolation.

4. Identical configuration between two words caused few errors, the percentages of error being 5.27 and 1.08 for test and retest respectively.

5. An analysis of the cues and details tests from the point of view of the proportion of the words remaining constant regardless of what aspects of the words were involved showed that the larger the proportion of identity between two words, when configuration was considered as one aspect of that identity, the more confusing the two words were. As a rough measure for ranking the words according to the amount of identity they possessed with competing words, each element being given equal weight, a count was made of the number of letters in the words and the configuration to make the denominator and a count of each of these parts of the word that were identical to make the numerator of the desired proportion. The critical ratios for the words most alike and least alike were large, being 7.25 for the initial tests and 7.87 for the retests for the proportions 16/20 as compared with 4/20.

6. When the letters and the configuration remained the same, the order of the letters gave rise to a relatively large number of errors.

7. The addition or omission of one letter in words otherwise remaining the same was not observed in a relatively large number of cases in the initial tests (29.5 percent). This percentage dropped to 9.20 on the retests. The position of the addition or omission apparently was not a factor.

8. Disorientation was present in a continuum of degrees from practically no disorientation to apparently complete disorientation so far as the letter forms tested in this study are concerned.

9. Reversible letters appearing in words cause more difficulty than those same letters appearing in isolation or the disorientation of the whole word or a part of it.

10. The horizontal disorientation test items showed a reliably higher incidence of error than either of the other directions of disorientation on both the initial tests and the retests. The intercorrelations between the scores for the three directions were:

Direction of Disorientation	Initial Tests Number	r	P. E.	Retests Number	r	P. E.
Vertical and horizontal	87	.725	± .034	77	.802	± .028
Horizontal and diagonal	87	.791	± .026	77	.692	± .039
Diagonal and vertical	87	.907	± .052	77	.805	± .027

It will be noted that the correlations involving the scores on the tests of horizontal disorientation are reliably lower than that between the diagonal and vertical directions. From these data, then, it would seem that the horizontal errors are, to some extent, a particular type of difficulty. The intercorrelations among all directions, however, showed a high communality of the difficulty.

The effects of early training noted were:

1. Training, although reducing the total incidence of all errors, apparently tended to pull the attention of the children more and more to the beginning of the word.
2. While training apparently affected the individual patterns somewhat, the pattern of difficulties for the group as a whole underwent surprisingly little change over the training period allowed and under the teaching methods employed in this experiment.

RELATIONSHIP OF RESULTS TO INTELLIGENCE AND ACHIEVEMENT

A multiple correlational analysis showed that the scores from these tests when administered before or at the start of reading training contributed only a negligible amount toward the prediction of achievement over and above the predictive value of mental age.

There was an increase in the correlation between the achievement test scores and the retest scores over the correlation with the initial test scores. This is shown in the tabulation below:

Group	Number	Initial Tests	Retests
Orphanage	24	.236 ± .127	.637 ± .081
First grade and Junior Primary	53	.212 ± .090	.344 ± .082

The large rise in the correlation for the orphanage group scores gains added significance when the higher ceiling of the tests for this group is recalled. On the whole, the Junior Primary and first grade groups made rather high scores on the initial tests, so that the chance for improvement was considerably less. Performance on the tests seems to respond to training somewhat in the same way that achievement does. If this is true, further experimentation may show that this approach may be of value in the diagnosis of individual difficulties.

The correlations found here between mental age and achievement are slightly below the average but well within the range of coefficients re-

ported by others between various tests of reading ability and mental level (2, 5). Gates (5) reports such correlations ranging from .50 down. Deputy (2) gives correlations between I.Q. and reading test scores at various levels of the elementary school grades of from —.10 to .90, averaging about .50.

COMPARISON OF RESULTS WITH THOSE OF OTHER EXPERIMENTERS

Orton's (13, 14, 15) belief that practically all confusions can be traced to an orientation difficulty does not seem to be substantiated by the present results. There was a definite incidence of error in those test items which involved no letters which form other letters when disoriented.

Teagarden (18, 19) finds orientation in written or printed symbols in a continuum of degrees from complete disorientation to perfect orientation. The distribution of scores on the initial tests and the retests in the present study indicate the same situation.

Meek's (9) findings are relevant to the pattern of potency of cues found in the present study. She gives these specific findings: (1) Her subjects used the last two letters of four letter words as cues for learning oftener than they used the first two or the middle letters. (2) The initial two were oftener used than the middle ones. (3) The initial letter alone is oftener used than the final letter alone. The findings of the present experiment, it will be recalled, are that the initial part of the word is used slightly in excess of the latter part and that very small use is made of the middle of the word. The difference in the percentages of misrecognition between the first two and the last two letter cue situations in Meek's study is only 2.43; no probable errors are quoted for these percentages. Three of the six words having the last two letters identical with the key words had identical configurations also. One of these is a confusion between *doll* and *bill*. It will be noted that the important initial letters of these words are horizontal disorientations of each other. This one pair of words shows a considerably larger percent of error than any other word in any category. Thus, in general, Meek's results probably show much the same fundamental pattern of cue potencies as that exhibited here.

From a rough and subjective analysis of the errors made by four-year-olds on test material at the end of a learning experiment, Davidson (1) reports 10 percent of all errors as due to identical initial letters in the words confused. The next largest percent of errors was 5 percent for words with identical final letters. Identical letters in the middle of words claim only 1.8 percent of the errors. The only percentages larger than that

for the initial letter category were guesses (13.6 percent) and geometrical shape (16.0 percent). In this latter category every example that she quotes has some element besides the geometrical form identical. The errors *house* read as *home, party* as *pretty,* and *out* as *cut* are all classified as geometrical form confusions. Thus again there is probably no fundamental disagreement with the findings of the present study, but the lack of a controlled analysis of the data makes it impossible to ascertain the true situation.

When the letters which become other letters when disoriented and which have been proved to be the hardest for first grade children to match were placed in three letter words for matching, Smith (17) found an average of 19.2 percent errors on words having these letters at both the beginning and the end. When they appeared only at the end the percentage dropped to 17.5; it dropped to 15.3 when they were placed at the beginning of the words only. Both the problem of disorientation and of influence of position in the word are involved in these results. However, it would seem that when an item that was hard to match when presented in isolation was placed at the beginning of the word, it was noticed more than when placed at the end. The present results are in agreement here.

Apart from the orientation problem, Monroe (11) reports a large incidence of "vowel errors." These are undoubtedly due in large part to the many different sounds attached to the same letter forms in our language, but there is also the consideration that vowels occur very frequently in the middle of words. According to the present results, the middle section of words is least carefully observed by children and, therefore, gives rise to most errors. It would seem likely then that at least a part of the difficulty lies in that failure rather than solely in the lack of phonetic knowledge and ability.

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A COMPARISON OF THREE MEANS FOR MEASURING EFFICIENCY IN TEACHING[1]

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THE experiment reported herein was conducted under the supervision of the writer by a hand-picked group of fourteen graduate students, all of whom had been well trained previously in the devices and techniques of supervision in the writer's graduate classes at Indiana State Teachers College. The plan of the study, briefly and roughly stated, was to send a team of observers to witness the same teaching acts of each of a group of teachers, to have the observers, working independently of one another, to evaluate each teaching performance, one third of the team using one measuring device, one third using another, and one third using another. When all the teachers of a group had been observed, the rankings of the teaching performances as determined by each of the three means for measurement were correlated with the rankings as determined by each of the other two means. This process was repeated with other groups of teachers until a total of eight assignments of teachers, including one hundred eleven different individuals, had been visited.

The three methods of rating used were attention scores, score-card scores and general, informal estimates. The experiment did not include an attempt to evaluate teaching performances on the basis of measured results in terms of pupil achievement, because the experimenters were unable to control the administrative procedure necessary for giving the pre-tests and post-tests.

An attention score for a class was determined by dividing the total minutes of obvious pupil attention by the total possible minutes of pupil attention. Before the experiment was formally inaugurated the attention scorers were given careful instructions on the Morrison and Blume technique of detecting attention.[2] This instruction included trial observations.

[1] Acknowledgment for assistance in making this study is gratefully extended to the following graduate students of Indiana State Teachers College: Thirza E. Bunce, Consuelo Clehouse, Mary Fread, Hazel B. Harrigan, Daisy Marvel Jones, Louise Love, Oakley O. McClaine, W. R. Moore, Rolland R. Ripple, Paul Robertson, James Staley, Vina Syester, J. C. Tranbarger, and Ira E. Williams.

[2] Morrison, Henry C. *The Practice of Teaching in the Secondary School* (Chicago: The University of Chicago Press, 1926), Chapter VIII. Blume, Clarence E. "Techniques in the Measuring of Pupil Attention," *The Second Yearbook* of the Department of Supervisors and Directors of Instruction (New York: Bureau of Publications, Teachers College, Columbia University, 1929), Chapter III.

The members of the teams who used the score cards were also carefully instructed in advance and given practice in the use of the score card. The score card used was the same as that used in supervised student-teaching at Indiana State Teachers College, and although it is far from ideal, it probably is as good as most others. The score card contained forty-three rubrics grouped under five major heads, and after these rubrics were five columns headed *A*, *B*, *C*, *D*, and *E*. The team members using the score cards checked in the column they thought appropriate after each of the rubrics on the score card that they thought were evinced during a period of observation. Then by assigning values of 5, 4, 3, 2, and 1, respectively, to checkings found in the five columns, a score for each teaching performance was obtained by dividing the sum of all checking values by a number equal to the product of the number of items checked and 5.

The procedure followed by the team members who ranked the teaching performances on the basis of general impression was less definite. The team members with the most teaching experience were assigned to this. They were told to take whatever notes they wished and without conferring with any one to rank the performances of a given assignment from best to poorest as they saw fit after all teachers of an assignment had been visited.

Only student-teachers were observed in the experiment, principally for the reason that their pupils were accustomed to having visitors and were less disturbed by the presence of the teams than pupils in regular classes probably would have been. Also, student-teachers of an assigned group were kept as nearly homogeneous as possible. First-term student-teachers were never included in an assignment with second-term ones; primary teachers, intermediate-grade teachers, and high-school teachers were kept in separate assignments; high-school teachers in classes following the recitation procedure were kept separate from those in classes following laboratory procedure. The number of student-teachers included in an assignment ranged from ten to nineteen. These numbers were kept small primarily for the reason that the informal estimators would find it impossible to rank large groups from best to poorest.

Table I shows the years of teaching experience of each of the fourteen team members, the groups of student-teachers they were assigned to observe, and their duties on each team. The letters A, S, and E, respectively, indicate that a team member measured attention, used a score card, or estimated the teachers informally. "Stat." means that a team member served as a statistician, his duty being to compute the attention scores and score-

card grades after his teammates supplied him with the raw data. It will be observed from the table that teams of six members each visited the student-teachers of the first four groups, two members to each measuring device, and that teams of three members each visited the remaining student-teachers. It should be noted, too, that the most experienced members of the several teams did the informal estimating and that the least experienced measured attention. In general, the team members had the same duties to perform when working with one group of teachers as with a later group.

Since each of the three means for measuring efficiency in teaching was employed by two members of a team that observed the first four groups of student-teachers, a measure of the reliability of each means of measurement can be had by computing coefficients of correlation between the rankings found by the two members of a team who employed the same means. The figures representing these correlations are shown in Table II.[3]

TABLE I

EXPERIENCE OF TEAM MEMBERS AND THEIR ASSIGNMENTS TO GROUPS OF STUDENT-TEACHERS

Team Members	Years of Experience of Team Members	Groups of Student-Teachers to Whom Assigned							
		I	II	III	IV	V	VI	VII	VIII
A	27		E	E					E
B	26		E	E		Stat.			Stat.
C	24	E			E	E			
D	12	E			E				S
E	10		S	S			E		
F	7	S			S			E	
G	6	Stat.			Stat.		Stat.	Stat.	
H	5	S			S		S		
I	5		Stat.	Stat.		S			
J	5		S	S				S	
K	0		A	A					A
L	0	A			A		A		
M	0	A			A			A	
N	0		A	A		A			

TABLE II

COEFFICIENTS OF CORRELATION BETWEEN RANKINGS BY OBSERVERS WHO USED THE SAME DEVICES FOR MEASURING

Means for Measuring Efficiency in Teaching	Groups			
	I	II	III	IV
Attention	.67	.78	.83	.84
Score cards	.84	.49	.58	.65
Estimates	.47	.92	.67	.26

[3] The Spearman Footrule formula was used throughout this study in computing all correlations of zero order.

A comparison of Table II with Table I indicates that the personnel of the teams of observers influences the accuracy of some of the measurements. Data to be presented in Table III indicate the same thing. The correlations shown in Table II indicate that the measures of attention agree quite well and that the measures, therefore, probably are approximately correct. In general, the agreement is not so close between the score card users and between the informal estimators, but noticeable differences are evident between teams of observers in this regard. One team of six members observed the student-teachers of Groups I and IV, and another team of six members observed the student-teachers of Groups II and III. The score card users on the team that observed Groups I and IV agreed better than those who observed Groups II and III, and the informal estimators who observed Groups II and III agreed remarkably better than the other pair of estimators. On the whole, it seems safe to conclude that the various measures are approximately correct except the informal estimates in Groups I and IV and perhaps the score-card rankings in Groups II and III.

The most significant correlations are those between the rankings as found by the attention scorers and the score card users, the attention scorers and the general estimators, and the score card users and the general estimators. Coefficients of correlation showing the relationships just mentioned, and in the same order, are shown in Table III for all eight of the groups of student-teachers.[4] Also, in the bottom four horizontal lines of Table III, correlations are shown between the rankings by the individual estimators of the six-man teams and the *A* and *S* rankings of the same. The purpose of presenting these figures is to reveal any erratic estimator whose unreliable measures in Groups I and IV may have been responsible for the lack of agreement between estimators shown in Table II.

The manner in which Table III should be read can be illustrated by one or two of the horizontal rows of figures in the table. The first row at the top shows that the coefficients of correlation between the rankings of student-teachers by attention measurement and by score-card measurement in the eight groups of student-teachers are .07, .41, .07, .44, .61, .26, .47, and .31, respectively. The bottom row of figures shows that the coefficients of correlation between the rankings given by the score card users

[4] In Groups I to IV the medians of each pair of attention scores, of each pair of score-card scores and of each pair of informal estimates, were used in determining the final rankings on which the correlations of Table III are based.

and by the second of the two informal estimators of Groups I, II, III, and IV, are .37, .49, .63, and .36, respectively.

TABLE III

COEFFICIENTS OF CORRELATION BETWEEN RANKINGS AS DETERMINED BY THE DIFFERENT DEVICES FOR MEASURING

Rankings Being Compared	Groups							
	I	II	III	IV	V	VI	VII	VIII
A and S	.07	.41	.07	.44	.61	.26	.47	.31
A and E	.21	.21	−.10	.38	−.16	.26	.73	.21
S and E	.83	.38	.54	.63	.44	.97	.65	.75
A and E_2	.09	.16	.02	.33				
A and E_3	.14	.24	.19	.37				
S and E_2	.93	.29	.41	.34				
S and E_3	.37	.49	.63	.36				

Before noting the major correlations presented in Table III, the question of individual differences between informal estimators should be settled. Attention was first directed toward this in Table II, and it was observed that the two informal estimators who rated the student-teachers of Groups I and IV did not agree very closely. When the rankings by each of these estimators are compared to the rankings on the bases of attention scores and of score-card scores, the erratic individual, if any, should be brought to light. Some evidence of an erratic individual estimator is found in Table III. The coefficient of correlation between the score-card rankings and the rankings by one estimator of the student-teachers in Group I is .93, and with the other estimator it is only .37. The estimator represented by this low figure is the same one who served as estimator for Group V, and both the A-and-E and the S-and-E correlations for Group V are the lowest of any of the eight such correlations, respectively. There is no other evidence against this particular estimator, but that which has just been indicated certainly seems to be damnatory. However, it is not conclusive.

Without question, the most significant revelation in Table III is that of the high correlations between score-card and estimated rankings compared to other correlations. With every group of student-teachers, except V and VII, the S-and-E correlations are higher than any others, and in Group V the informal estimator's rankings are questionable.[5] It is not

[5] The score-card rankings in Group VII are by one of the team members who used the score-card in Groups II and III, where the two such team members were shown in Table II to be somewhat at variance. This observation helps still further to emphasize the fact that the S-and-E correlations are higher than others. It is possible that the

possible to state with exact certainty just how these high S-and-E coefficients of correlations should be interpreted, for those of Groups I and IV are somewhat questionable because of some disagreement between score-card users. With the evidence not entirely convincing against any of the estimators, and with the disagreement between score-card users not serious at any point, it seems entirely justifiable to conclude that the methods of score-card measurement and of informal estimates for evaluating efficiency in teaching agree better than the method of attention-score measurement agrees with either of these. This tentative conclusion is reinforced by the multiple correlations shown in Table IV.

All correlations mentioned thus far are of zero order. In Table IV the rankings by attention scores are correlated with those by score-card scores and informal estimates, the rankings by score-card scores are correlated with those by attention scores and informal estimates, and rankings by informal estimates are correlated with those by attention scores and score-card scores.

TABLE IV

COEFFICIENTS OF MULTIPLE CORRELATION BETWEEN RANKINGS AS DETERMINED BY THE DIFFERENT DEVICES FOR MEASURING

Rankings Being Compared	Groups							
	I	II	III	IV	V	VI	VII	VIII
A with S and E	.28	.42	.13	.47	.73	.21	.74	.10
S with A and E	.83	.51	.55	.67	.75	.96	.66	.77
E with A and S	.84	.39	.55	.65	.70	.96	.82	.75

The most apparent and most significant comparison to be observed in Table IV is that the A-with-S-and-E correlations are definitely lower than the others. All such correlations are low except with Groups V and VII, and it has been shown before that some of the rankings of student-teachers in these two groups are probably erroneous. The multiple correlations of S and of E with the other rankings are approximately equal, and, on the whole, they are relatively high. The lowest are with Group II, in which case the score card was ill-adapted, since the classes taught by the student-teachers in Group II followed laboratory procedure instead of recitation procedure.

exceedingly high S-and-E coefficient of correlation of .97 for Group VI is unduly high. The general estimator for Group VI, team member E, had been a score-card user for Groups II and III, and it may have been that he experienced a subconscious carry-over from the rubrics of the score-card to the informal estimating of the later group of student-teachers. However, team member F, who estimated Group VII after having used score cards with Groups I and IV, does not arouse such a suspicion.

SUMMARY AND CONCLUSIONS

The experiment consisted of measuring teaching performances of eight different groups of student-teachers numbering in all one hundred eleven different individuals, and then comparing the three measurements by means of correlations. The three means for measurement that are compared are attention scores, score-card scores and general, informal estimates. The results of the experiment are not wholly conclusive, but they probably are as nearly so as results ordinarily can be under the conditions attending most research in evaluating teaching. The following conclusions can be defended in light of the data of the experiment.

1. There is some positive correlation between the three devices for measuring efficiency in teaching. For example, student-teacher number 3 in Group II received the same ranking by each of the three methods of measuring. The same is true of student-teacher number 15 of the same group and of student-teachers numbers 5 and 7 of Group VII. Such perfect agreement is not purely accidental.

2. The effectiveness of the devices of score-card measurement and general, informal estimating depends to an extent upon who it is that is using the devices. The correlations between rankings given student-teachers by the two members of a team of observers who used the same measuring device are not very high in a few instances.

3. The effectiveness of score-card measurement depends upon the adaptability of the score card to the type of teaching procedure being followed. This is especially emphasized with the student-teachers of Group II, who followed a laboratory procedure in teaching. The agreement between the two score card users in this instance was less than in any other group.

4. On the whole, the agreement between the two members of a team who measured by the same device is very gratifying. The measures of attention, the score-card scores and the informal estimates are probably approximately correct for their types. The few low correlations between the rankings by two score-card users or two general estimators of a team probably are due to an erratic scorer or estimator. The agreement between the attention measures is especially noteworthy. Such should be expected, however, since their device is more nearly objective than the others.

5. The zero correlations and the multiple correlations between the rankings of the student-teachers as found by the three types of measurement show that the attention-score rankings do not compare as favorably

with the rankings by the other two means as the rankings by the other two means compare with one another. Although attention scores in themselves are more reliable than score-card scores or informal estimates, they are not a valid indication of teaching merit.[6] The correlations between score-card rankings and informal-estimate rankings are relatively high. The lowest is with the group of student-teachers who were teaching by laboratory procedure where the score card was not well adapted. Both of these methods of measuring efficiency in teaching are subjective. The score-card scores are based upon subjective measurement by units, and informal estimates are based upon blanket subjective measurement. Since the rankings determined by these two subjective means for measuring bear higher correlations than any comparison involving attention scores, it seems that the more subjective means are the better ones of the three included in this investigation.

[6] Three assumptions lie back of the proposal to use attention scores as a means for evaluating teaching: (1) Good teaching will hold pupils' attention and poor will not; (2) With pupils remaining attentive, definite and valuable learnings are bound to result; (3) Certain external evidences of attention may be regarded as valid indications of attention. The validity of the device depends on the truth of these assumptions, and the truth of the assumptions is highly questionable.

That good teaching will hold pupils' attention and poor will not, errs in the implication that pupils' attention is influenced only by stimuli that are definitely under the control of the teacher. Other factors which are known to enter into the situation are the pupils' previously acquired interests, their health and hygiene, outside disturbances, the weather, recent or impending extra-curriculum activities of an exciting nature, and certain factors of heat, light and ventilation which are beyond the teacher's control.

That with pupils remaining attentive, definite and valuable learnings are bound to result, carries the implication that all teaching materials and content are worthy. But foolish stories and nonsense demonstrations will hold attention so long as they are novel.

That certain external evidences of attention may be regarded as valid indications of attention, errs in the implication that mental states have standardized objective physical concomitants. A child may be attentive to all that is said, but still sit languid with his eyes closed, or look out of the window. Also, he may follow every movement of the teacher with his eye but have his mind on her dress or physical appearance.

THE INCIDENCE OF ERROR IN DIVISION WITH A ONE-FIGURE DIVISOR WHEN SHORT AND LONG FORMS OF DIVISION ARE USED

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In a former study by the writer[1] it was shown that fewer errors were made when the long form of division for a one-figure divisor was used than when the short form was used. The results for the investigation were taken from approximately 200 pupils, divided equally into two comparable groups, for each grade from the fifth to the fifteenth inclusive. Grades XIII, XIV, and XV constituted the first, second, and third years, respectively, of normal school. The test in division forming a basis for the study consisted of 30 examples, of which 20 contained three figures in the quotient and the remaining 10 examples contained four figures in the quotient.

As previously stated, more errors were made by the group which used the short form of division than by the other group. The number of errors is one index by which to measure the relative merits of the two methods. Another vital factor which affects the two forms of procedure is the point of incidence of error. This study was made to see if there was much variation between the two forms in the point of incidence of error. That is, an effort was made to determine if there was a tendency for the first error in the quotient in a particular grade to occur in the first, second, third, or fourth figure of the quotient. The percentages of initial error for each of the four possible places in the quotient for short-and-long-division are shown in Tables I and II.

The points of inception of error for short-and-long-division were slightly different for the first quotient figure as is shown by Tables I and II. When the long form of division was used in Grades V-VII, inclusive, the percentage of error in the first figure was greater than for the short form for the same grades. This situation may be explained by the fact that the use of the long form of division for a one-figure divisor was unfamiliar to the pupils tested.[2] Under such conditions, many errors would result in the first estimation.

[1] Grossnickle, Foster E. "An Experiment with a One-Figure Divisor in Short and Long Division," *Elementary School Journal*, XXXIV (March-April, 1934), pp. 496-506; 590-99.

[2] *Ibid.*, p. 594.

TABLE I

PERCENTAGE OF FREQUENCY FOR INCIDENCE OF ERROR FOR EACH OF THE FOUR POSSIBLE FIGURES IN THE QUOTIENT WHEN THE SHORT-FORM OF DIVISION WAS USED FOR GRADES V-XV

Position of Quotient Figure	Grade V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	Total for all Grades
First figure	15.5	12.2	13.5	11.8	10.6	9.2	10.2	9.6	11.9	7.7	10.3	11.7*
Second figure	31.4	34.0	33.4	36.6	32.0	36.0	29.8	39.2	40.9	34.0	37.1	34.5
Third figure	40.6	40.8	39.6	40.7	42.9	39.1	48.2	39.6	35.0	44.0	39.4	40.9
Fourth figure	12.5	13.0	13.5	10.9	14.5	15.7	11.8	11.6	12.2	14.3	13.2	12.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(*Derived from total frequencies)

TABLE II

PERCENTAGE OF FREQUENCY FOR INCIDENCE OF ERROR FOR EACH OF THE FOUR POSSIBLE FIGURES IN THE QUOTIENT WHEN THE LONG-FORM OF DIVISION WAS USED FOR GRADES V-XV

Position of Quotient Figure	Grade V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	Total for all Grades
First figure	16.0	17.6	17.2	12.5	9.9	10.1	5.4	10.7	11.5	13.9	8.1	13.7*
Second figure	20.4	19.4	24.1	23.4	25.2	26.2	25.6	27.5	27.9	33.3	37.0	24.2
Third figure	41.1	39.6	37.4	43.9	46.2	45.0	45.1	43.9	39.4	32.4	39.6	41.3
Fourth figure	22.5	23.4	21.3	20.2	18.7	18.7	23.9	17.9	21.2	20.4	15.3	20.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(*Derived from total frequencies)

Tables I and II show that there was much agreement in the percentage of inception of error for the third quotient figure for both the short and long forms of division. However, for the fourth quotient figure, there was a much greater percentage of initial error in the long form of division than for the short form. The later the point of initial error, the more favorable the form of division which will produce such an occurrence. When the first error in an example is found in the fourth figure of a four-figure quotient, the attention span of the pupil has not lapsed as quickly as when the point of error is found in the second figure. The evidence in the tables under consideration shows that a greater percentage of pupils using the long form had the initial error in the final quotient figure than when the short form of division was used. Hence, the attention span of a pupil was uninterrupted for a greater time than when the point of initial error was in the fourth instead of the second quotient figure. Since the long form of division was favorable for the initial error to be in the fourth quotient figure, it may be concluded that the attention span of a pupil will be

greater when he uses the long form of division instead of the short form for a one-figure divisor.

The former article cited showed that fewer errors were made by the pupil who used the long instead of the short form of division. This study showed that a pupil's attention span was less interrupted and more constant when the long procedure in division was used. Therefore, objective evidence emphatically points towards the use of the long form of division when the divisor is a one-figure number.

DIRECT vs. INDIRECT METHODS OF INSTRUCTION IN SPEECH

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THIS article reports the results of a semester's study of the direct and indirect methods of instruction in speech. It attempts to answer the question: Should the language, voice, and bodily action involved in speech be made the topic of classroom discussion, or should the recitation be devoted to subject matter alone? The data on which this study is based are the ratings of 62 high-school freshmen enrolled in the freshman speech classes at the Wisconsin High School, Madison, Wisconsin, before and after a semester of speech training. The ratings were made by eighteen judges representative of the average non-selected audience. At the first class meeting these high-school students were told that on the following day their speech was to be judged by a board of eighteen judges. The following directions were given to guide them in preparation:

"You have been given a sheet of paper. In the upper left hand corner is a number. Tomorrow when your number is called, you will be given four minutes to read and speak. You will read that part of a story which is found on the paper with your number. When all of the students have finished reading, the judges will have heard four complete stories. Read for them so that they will get all of the thought of your section.

"In addition to reading, you are to make a speech. In this speech you are to explain to the group how to make some article or how to do some job. For instance, you might tell "How to Make Fudge," "How to Change a Tire," or "How to Make a Kite." Choose a simple process, one that you know exactly how to do yourself. Remember that at the beginning no one in your audience knows the process. When you are through, however, everyone in your audience should know how to go about it. Make each step simple and easy to follow. Tell what materials you use and exactly how you use them. You will be given two minutes to teach the process."

The classes were then dismissed until the same hour on the following day. The stories, which were cut into sections for reading, were *The Ransom of Red Chief* by O'Henry; *How Tom Sawyer Whitewashed the Fence* by Mark Twain; Chapter One of *Treasure Island* by Robert Louis Stevenson; and *A Dilemma* by S. Weir Mitchell. Each section was about one hundred and fifty words. By reading stories that had been cut into sections, the students read similar but not identical material. This made

it possible for the judges to compare the work easily without the monotony of listening to the same selection sixty-two times.

The eighteen persons acting as judges represented eleven different vocations. There were three housewives, one university senior in journalism, one lawyer, one doctor, one college instructor in English, one janitor, two ministers, one librarian, one professor of rural sociology, one radio director, and five speech teachers. The judges ranged in age from nineteen to sixty-five.

Each judge was given a sheet of paper divided into four sections marked POOR, FAIR, GOOD, and EXCELLENT respectively. He was then given the following directions:

"You are asked to judge the speech of sixty-two high school freshmen. Each person will read part of a story and give a short speech in which he explains how to make something. Each student will announce himself by number, and you are to place his number in the section on your paper which you feel represents his ability. If you consider his speech excellent, place his number in the section marked EXCELLENT. If, on the contrary, you think he is poor, place his number in the section marked POOR. If you believe he is good, but not excellent, place his number in the space marked GOOD, and if he is between good and poor, place his number in the section marked FAIR. Use your own method of judging. Here you have the same right to an opinion that you have when you listen to a speaker in life. We are interested in getting your independent judgment."

The ratings of these judges were then weighted; 1 for E, 2 for G, 3 for F, and 4 for P, and the average numerical rank was determined for each individual. Students were then arranged from 1 to 62 in order of rank. They were placed in the three sections so that the three sections to be taught would have an equal number of students in approximately equal ability. No. 1 placed in section 1; No. 2 in section 2; 3 in section 3; 4 in section 3; 5 in section 2; 6 in section 1, etc. Section 1 contained 20 students with an average rank of 2.72; section 2 contained 19 students with an average rank of 2.79; and section 3 contained 23 students with an average rank of 2.59. Each section was then taught by one of the three different methods. At eight o'clock the "indirect" method was used; at nine the "direct" method; and at ten a combination of the "direct" and "indirect." The same person taught all three sections.

The outstanding characteristic of the indirect method was that voice and language difficulties were not specifically mentioned. The class period was devoted to a discussion of subject matter only, but the subject matter

was chosen by the teacher, and assigned to each individual with his particular speech difficulty in mind. Selections requiring volume were assigned to the student with the weak voice; those requiring rapid speech to the student with slow halting delivery, etc. There were readings from all types of literature, discussions of controversial questions, reports from other courses in the high school curriculum. At no time was the student's attention called directly to his voice, bodily action, or language.

The outstanding characteristic of the direct method was that the student was made directly aware of his specific difficulties of voice, action, and language. Methods of correction were outlined. Improvement was noted and discussed by the class. Section 3 was taught by a combination of the two foregoing methods, the training being about equally divided between the direct and indirect method.

The same aspects of speech were given consideration in each of the three sections. The same amount of time was devoted to the various units,

SECTION 1—INDIRECT METHOD

Student	Rating before taking course	Rating after taking course	Dev. before	Dev. after
1.	3.125	3.846	.402	1.313
*2.	2.471	2.929	.252	.396
3.	2.889	2.286	.166	.247
4.	2.118	1.667	.605	.866
*5.	2.941	3.133	.218	.600
6.	1.889	1.400	.834	1.133
*7.	3.235	3.067	.512	.534
8.	4.000	2.933	.277	.400
*9.	2.167	1.867	.556	.666
10.	2.235	1.800	.488	.733
*11.	1.889	1.600	.834	.933
*12.	2.667	1.867	.056	.666
*13.	2.823	2.933	.100	.400
14.	3.059	3.200	.336	.667
*15.	2.556	2.067	.167	.466
16.	2.222	1.933	.501	.600
17.	2.833	3.000	.110	.467
18.	3.556	3.867	.833	1.334
19.	2.833	2.333	.110	.200
20.	2.944	2.933	.221	.400
	54.452	50.661	8.578	13.021
Av.	2.7226	2.533	.4289	.651
D.	.190			
P.E.D	.147			
$\frac{D}{P.E._D}$	1.286 which means 8004 chances in 10,000 that this is a real difference.*			

* Thorndike, Edward L. *An Introduction to the Theory of Mental and Social Measurements*, Table 45, page 200. Tables of values of the normal probability integral.

and they were considered in the same order. That is, when section 1 was working for improvement in bodily action, sections 2 and 3 were working for the same subject matter. The following phases of speech were considered in each of the three sections: bodily action, voice, oral language, reading aloud, public discussion, conversation, debate, dramatization, dramatics, parliamentary law, and public speaking.

At the end of the semester, the students appeared before a board of seventeen judges for a final rating. Twelve of the judges had ranked the students in their performances before taking the course, and the five substitutes represented as great a variety of vocations as had been present on the first board of judges. There were two librarians, one professor of English, one professor of Rural Sociology, one janitor, three housewives, one graduate student in engineering, one lawyer, one minister, one radio director, and five speech teachers. The method of judging was the same as that used at the beginning of the semester. The average rank for each student was computed in the same way. The following lists show the ranks

SECTION 2—DIRECT METHOD

Student	Rating before taking course	Rating after taking course	Dev. before	Dev. after
1.	2.111	2.357	.6835	.0287
*2.	1.278	1.2	1.5165	1.1857
3.	2.333	1.8	.4615	.5857
*4.	2.333	2.125	.4615	.2607
5.	3.167	2.625	.3725	.2393
6.	2.750	2.875	.0445	.4893
7.	2.389	1.437	.4055	.9487
8.	3.056	2.500	.2615	.1143
9.	1.958	2.750	.8365	.3643
10.	2.889	2.312	.0945	.0737
11.	3.611	2.437	.8165	.0513
*12.	3.056	2.500	.2615	.1143
13.	3.778	3.235	.9835	.8493
*14.	2.667	1.824	.1275	.5617
*15.	3.333	2.412	.5385	.0263
16.	3.722	3.000	.9275	.6143
17.	3.000	2.176	.2055	.2097
18.	3.222	2.941	.4275	.5553
19.	2.444	2.823	.3505	.4373
	53.097	45.329	9.7765	7.7099
Av.	2.7945	2.3857	.5146	.4057
D.	.409			
P.E.D	.127			
D / P.E.D	3.22	which means 9845 chances out of 10,000 that this is a real difference.†		

† Thorndike, Edward L., *Op. Cit.*

of the individuals in each section before and after speech training in these classes. The names of the girls are starred.

A mere comparison of the ranks before and after taking the courses shows that in section 1, thirteen out of twenty students received a higher rank from the judges after taking the course, while seven received a lower rank. In section number 2, fifteen out of nineteen received a higher rank after taking the course, while four received a lower rank. In section number 3, twenty received a higher rank after taking the course, while three received a lower rank.[1] The amount of improvement may have been greater than these ranks would indicate since the tendency in both judgings would seem to be to spread the grades.

SECTION 3—COMPOSITE METHOD

Student	Rating before taking course	Rating after taking course	Dev. before	Dev. after
*1.	3.278	2.588	.684	.437
*2.	3.056	2.529	.462	.378
*3.	2.833	2.235	.239	.084
*4.	1.944	1.529	.650	.622
*5.	2.389	1.823	.205	.328
*6.	2.444	1.941	.150	.210
7.	2.722	2.823	.128	.672
*8.	2.750	1.412	.156	.739
*9.	4.000	3.588	1.406	1.437
10.	2.625	2.588	.031	.437
*11.	2.118	1.353	.476	.798
*12.	2.778	2.	.184	.151
13.	2.750	1.765	.156	.386
*14.	2.471	1.941	.123	.210
15.	1.389	1.294	1.205	.857
*16.	2.667	2.353	.073	.202
17.	2.722	2.647	.128	.496
*18.	2.235	1.706	.359	.445
19.	2.882	3.294	.288	1.143
20.	1.889	1.706	.705	.445
21.	2.667	1.941	.073	.210
*22.	2.562	2.765	.032	.614
23.	2.500	1.647	.094	.504
	59.671	49.468	8.007	11.805
Av.	2.594	2.151	.348	.513
D.	.443			
P.E.D	.109			
D / P.E.D	4.06	which means 9968 chances out of 10,000 that this is a real difference.‡		

‡ Thorndike, Edward L., *Op. Cit.*

[1] One student dropped from section number 1 and one from section number 2, and since no shift could be made without jeopardizing the experiment, the third section was largest at the end. The figures given are the numbers at the end of the course.

SUMMARY AND CONCLUSIONS

The purpose of this study was to discover whether speech should be taught directly or indirectly and whether it should be taught in connection with other subjects or as a separate course. The speech ability of 62 high school freshmen was tested before and after taking speech in one of the three sections, each taught by a different method.

The first method, here designated as "indirect," was comparable with speech training taught in connection with other subjects—English, History, Science, etc., where emphasis is placed on subject matter, and the teacher, without the pupil's knowledge, gives him indirect speech training. Pupils in this section did not make outstanding progress. The coefficient of reliability showing the difference in ability before and after taking the course was only 1.33. This difference is not statistically significant and this method cannot be recommended.

The second method, labeled "direct," was in marked contrast to the foregoing. The students' attention was continually called away from subject matter to the technique of speech. Classroom discussion was never on *what was presented,* but always on the *style of presentation.* This direct method was more successful than the indirect, showing a coefficient of reliability of 3.32. Here there was at least a tendency toward improvement, which seems to show that the individual must be cognizant of speech weaknesses in order to improve his technique.

The third group combined the indirect and direct method by calling attention to each individual's speech difficulty, organizing for him a plan for improvement, and in addition discussing the subject matter used to bring about this improvement. The results in this group were encouraging. The coefficient of reliability of 4.06 shows that chances for improvement by this method are very great. The entire experiment seems to show that the greatest improvement in speech is made when speech is made the subject of direct instruction and in courses primarily designed for this purpose. Later experiments carried on in the university high school and in a high school at Neenah, Wisconsin, appear to confirm these results.

COLLEGE STUDENTS' INTEREST IN PERSONAL DEVELOPMENT

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THERE is an increasing tendency in education to adjust the teaching program to the needs and interests of the individual. One of the most important results of this movement is that it directs the attention of the teacher toward the student as a person and away from specific subjects. To understand the needs and interests of the child, one must study the child. His intelligence, his emotions, his social attitudes, his social responses, in brief, his whole personality must become the object of thoughtful consideration. While this idea has gained most headway in the elementary field, there is evidence of its penetration into secondary and higher education in the forms of personnel and guidance programs. High schools and colleges are studying the individual interests and needs of their students in order to aid them in their educational, social, and vocational adjustments.

FIRST INVESTIGATION

As a part of the personnel program of the Chico State College, three informal personal adjustment studies have been made. The first study was in the form of a card-sorting interest inventory. The names of vocations, academic subjects, and student personal and social relationships were typed upon separate cards. In addition to the title, a sentence explaining its meaning was included on each card. Fifty-two titles were included in the list of vocations; twenty-eight were included in the list of academic courses; and seventeen titles constituted the list of personal and social relationships.

The students were instructed to sort these cards into three groups: the first group was labeled "Greatest Interest"; the second, "Some Interest"; the third, "No Interest." An ordinary card-sorting tray was used. When the student finished, a summary of his card-sorting was recorded by the office assistant on a tally sheet, and the cards were shuffled ready for the next student. Two hundred twenty-eight freshmen—one hundred ten men and one hundred eighteen women—sorted the cards. Approximately one-third of these were in the Teachers College and two-thirds were in the Junior College.

The original purpose of this study was to provide information concerning the interests of students to be used during individual interviews. However, it seemed of value to investigate the comparative popularity of each of the topics listed on the cards. Accordingly, an arbitrary weight of two was assigned to the cards placed in the "Greatest Interest" group; a weight of one, to the "Some Interest" group; and zero to the "No Interest" group. For example, one hundred twenty-one out of a total of two hundred twenty-eight students placed the card bearing the title "De-

TABLE I

INTERESTS OF COLLEGE FRESHMEN IN VOCATIONS, ACADEMIC SUBJECTS AND PERSONAL AND SOCIAL FACTORS

Personal and Social Factors	Rank	Academic subjects	Rank	Vocations	Rank
Development of Personality	1	Music	10	Teaching	8
Scholarship	2	Psychology	11	Interior Decoration	25.5
Vocational Decision	3	English Grammar	13	Magazine Story Writer	34.5
Health	4	English Literature	14	Coaching Athletics	37.5
Social Life	5	Histofy	15	Aviation	41
Social Etiquette	6	Foreign Language	17	Radio	43
Reading	7	Dramatics	19	Journalism	44
Self-Support	9	Physical Education	20	Landscape Gardening	45
College Athletics	12	Physiology	21	Social Service	47
Fraternities and Sororities	17	Art	22	Scientific Research	48
Religion	17	Biology	25.5	Inventor	49.5
Sex Information	23	Philosophy	28	Photography	52
International Relations	24	Sociology	29.5	Forestry	54
Crime	27	Public Speaking	29.5	Law	56
School Politics	32	Home Economics	31	Advertising	57
Motion Pictures	39.5	Chemistry	33	Clerical Work	58.5
State and National Politics	53	Anthropology	34.5	Librarian	60
Writing Poetry	58.5	Economics	36	Civil Service	61
		Zoology	37.5	Commercial Business	62
		Mathematics	39.5	Agriculture	63
		Physics	42	Medicine	64
		Botany	46	Architect	65
		Astronomy	49.5	Engineering	66
		Political Science	51	Cartoonist	67
		Geology	55	Florist	68
				Woodwork	69
				Mechanical Work	70.5
				Nursing	70.5
				Manufacturing	72
				Diplomatic Service	73
				Electrician	74.5
				Salesmanship	74.5
				Missionary	76.5
				Sign Writing	76.5
				Army and Navy	78
				Banking	79
				Surveyor	80
				Milliner	81.5
				Sculptor	81.5
				Pharmacy	83
				Mineralogist	84
				Draftsman	85
				Commercial Shipping	86
				Linotype work	87
				Railroad work	88
				Reformer	89.5
				Ministry	89.5
				Denistry	91
				Jeweler	92
				Real Estate	93
				Barber	94
				Life Insurance	95
				Tailor	96
				Undertaker	97

Medians:

Personal and Social Factors	14.5
Academic Subjects	29.5
Vocations	70.5

velopment of Personality'' in the ''Greatest Interest'' group. One hundred seven students placed this card in the ''Some Interest'' group, and no student put this card in the ''No Interest'' group. Weighting the ''Greatest Interest'' cards two and the ''Some Interest'' cards one gives a total score of three hundred forty-nine for this topic. The other ninety-six topics were weighted in the same manner. The titles were then arranged in order and a rank value assigned to each. In Table I the ninety-seven topics and their respective ranks are listed. The topics are divided into three groups: column 1, Personal and Social Factors; column 2, Academic Subjects; and column 3, Vocations.

The relative popularity of the three groups of titles is revealed when the median ranks are compared. The median rank for Personal and Social Factors is 14.5; for Academic Subjects, 29.5; and for Vocations, 70.5. A survey of the individual topics finds the ''Development of Personality'' to be the one topic of most general interest. ''Scholarship,'' ''Vocational decision,'' ''Health'' and ''Social life'' were ranked second, third, fourth, and fifth, respectively. ''Music'' ''Psychology,'' ''English grammar,'' ''English literature'' and ''History'' were of most general interest in the academic subject group. ''Teaching'' stands at the top of the vocations group. The vocational titles fall low in such ranking because of the specific character of vocational interest. This table gives little information concerning the importance of any one topic for a given student. However, it does provide a general picture of the comparative interests of the group as a whole.

SECOND INVESTIGATION

The second investigation of personal adjustments was a study of the fundamental desires of another group of college freshmen. A list of nine desires was prepared. This list included Scientific Achievement, Artistic Accomplishment, Religion, Education, Healthy Body, Vocation, Personality, Home, and Money. Each of these desires was listed, and after each a brief explanation was given. For example, ''Home—a home of your own with a congenial and emotionally satisfying husband or wife, healthy children, and a good house with modern conveniences.'' Or, ''Scientific Achievement — through scientific research make some discovery that would be of lasting benefit to mankind, even though you received no recognition at the time of the discovery and no financial reward.'' The directions to the student were: ''In life we are continually choosing between alternatives. There are some things which are more greatly desired than others. Below you will find a list of those things which most of us desire

from life. Suppose you were told that you might have all of these. Which one would you want most? Which one second, third, etc.? Indicate the rank order by using '1' for that which is of greatest importance, and so on. If two are of equal importance, give them the same rank. When you have completed the ranking, write a short statement on the back of this sheet, indicating why you put the one you did first in importance and why you chose the one you did as that of least importance. Include any other comments you wish." The student was not required to sign his name but practically all of them did.

The median ranking of two hundred forty freshmen—one hundred twenty-two men and one hundred eighteen women—is shown in Table II. Personality and Healthy Body stand out as the two desires of greatest importance to the group. When the men and women were analyzed separately, but was found that the women placed Personality at the top of the ranking and Healthy Body second; while the men reversed this, placing Healthy Body at the top and Personality second. Home and Education received the same median ranking, and they share equally the third and fourth positions of importance. Vocation was ranked fifth, Religion sixth and Money seventh. Artistic Accomplishment and Scientific Achievement naturally rank low in this list since they appeal to a more restricted group. Analysis of the reasons given for placing a desire first or last in importance proved interesting. The dominant motive in the ranking was usually "happiness" or "personal satisfaction." An insight into the nature of the student is made possible by a study of the reasons given. Two typical statements are quoted here: "I choose Personality first because I believe that no person can be happy without congenial relations with his fellow men." This next is from a seventeen year old girl: "I choose religion, education, health, and personality as equal in importance because they are all factors of a well-rounded life. Religion gives one faith;

TABLE II

FUNDAMENTAL DESIRES OF COLLEGE FRESHMEN

Year 1931-32
N = 240

	Median Rank Order
Personality	1.5
Healthy Body	1.5
Home	3.5
Education	3.5
Vocation	5
Religion	6
Money	7
Artistic Accomplishment	8
Scientific Achievement	9

education, knowledge; health, physical ability; and personality, self-assurance. Money I choose last, perhaps because it is obviously the thing to do. However, it is true that material compensation is not entirely satisfying. Still—the first of the month *does* come around."

THIRD INVESTIGATION

The data for the third study were taken from the Junior Certificate application blanks filled in by each sophomore at the end of the fourth semester. The Junior Certificate is issued at the completion of the Lower Division requirements. The final question on this form is: "What experiences here at the college, either in courses you have taken or in school activities, have been most helpful to you by way of personal development?"

In Table III is a summary of the replies of two hundred six high sophomores. Forty-three percent of the group wrote in the names of courses as having been the greatest help. Thirty-three percent mentioned school activities; seventeen percent, associations with fellow students; four percent, contact with instructors; and three percent, field trips and excursions. These five types of contacts logically fall into two divisions: contact with instructors and contact with fellow students. Personal contacts with instructors, field trips, and courses taken, constitute one group totaling fifty percent; school activities and association with fellow students constitute the other group, which also totals fifty percent. From these data one concludes that, in the students' opinion, the instruction program and student contacts share equally as contributive factors in his personal development. Sixteen out of the hundred and six students mentioned overcoming feelings of self-consciousness and inferiority as the greatest benefit of their first two years in college. In seven cases this personal growth had been brought about through contact with fellow students, four; through recitation in class; and five, a combination of both of

TABLE III

STUDENTS' OPINION OF COLLEGE'S HELP IN PERSONAL DEVELOPMENT

N = 206

	Number	Percent
Courses Taken	88	43
School Activities	67	33
Contacts with Fellow Students	35	17
Personal Contact with Instructors	9	4
Field Trips	7	3
Total	206	100

these. The following are a few sample statements: "Being president of the freshman class gave me an experience that I had never had before. I was afraid to speak before a group and now I am not." "I am losing my inferiority complex and I am less self-conscious as a result of the friends and social contacts I have made here." "Courses in history and economics have influenced me a great deal in my decision as to my vocation." "Dramatics has helped me in self-expression; English courses have helped me to develop my conversation and speech, giving me confidence in my own ability."

CONCLUSIONS

1. Personal and social relations are of great interest and importance to these college freshmen.

2. Fundamental desires of greatest importance include personality, health, home, and a vocation; religion, money, scientific achievement and artistic accomplishment are of less importance.

3. At the end of the sophomore year the experiences contributing to the personal and social development of the students were distributed as follows: College courses taken, forty-three percent; school activities, thirty-three percent; contact with fellow students, seventeen percent; contact with instructors, four percent; and field trips, three percent. From this distribution of student opinion, it appears that faculty and student contacts share equally in aiding students in their personal development.

THE RELATIVE MERITS OF TWO FORMS OF DISCOURSE WHEN APPLIED TO CHILDREN'S FACTUAL CONTENT READING MATERIAL*

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THE PROBLEM

THE purpose of the study was to determine the relative merits in children's reading materials of two literary forms. The forms of discourse chosen are conversational and narrative-expository. The narrative expository form presents facts in a somewhat unadorned, largely expository style, while the conversational versions give the facts mingled with conversation between characters. The study specifically attacks the following four phases of the problem:

1. To determine which of the two literary forms is more satisfactorily comprehended.
2. To determine the relative word rate at which the children read the two styles of discourse.
3. To determine whether or not one type has an advantage over the other as to retention of content.
4. To determine which style of presentation children prefer when selecting materials to read which will reveal information.

SETTING FOR THE STUDY

The study included grades IV and VII. The experiment was carried on in the public schools of New Haven, Connecticut, in the fall of 1933. Children from eleven elementary schools and one large junior high school participated in the study. The children were probably average American school children, since they represented homes from a rather wide range of social and economic backgrounds. The children had experienced in their school reading a rather varied type of material. A broad reading program has been in operation in New Haven for several years. A check of their basal and supplementary reading materials revealed a considerable amount of both conversational discourse and narrative-expository form, the latter dominating, however, by a considerable margin, particularly at the seventh grade level.

The same children were used for studying comprehension, rate and retention. These children were designated Group B. Another group of

* Abstract of a dissertation, presented for the degree of Doctor of Philosophy in Yale University.

children was used in testing for style preference. They were designated Group A. The number of children in Group B was: grade IV, boys 102, girls 110, total 212; grade VII, boys 99, girls 112, total 211. By the time the retention check was made this group had diminished to the following figures: grade IV, boys 90, girls 96, total 186; grade VII, boys 94, girls 105, total 199. Group A consisted of: grade IV boys, 91, girls 113, total 204; grade VII, boys 94, girls, 98, total 192.

EXPERIMENTAL PROCEDURES

Group B was divided into two divisions at each grade level, and equated on the basis of combined scores on the reading sub-tests of the New Stanford Test, total scores on the ten sub-tests of the New Stanford Test, and chronological age. These divisions of each grade are designated as Division I and Division II. Extremes were discarded until the means were approximately the same. In fact, all differences in the means of the two divisions, when compared on the above bases, were statistically insignificant.

The two-group, rotation method was used for Group B, the rotation occurring at the end of the first half of the study. Thus, each division read both styles the same number of times. While Division I was reading a unit of one style, the other version of the same unit was being read by Division II.

The comprehension and retention scores were obtained from multiple-choice check tests. Each unit check test had ten statements with three choices. The reliability of the composite scores made on the check tests was measured by determining the correlation between the sum of scores for each half of the study on odd-numbered units and on even-numbered units. The coefficients of correlation were: grade IV, first half .80 ± .025, second half .82 ± .024; grade VII, first half .56 ± .048, second half .63 ± .043. When corrected by the Spearman Brown formula the coefficients respectively were: .89, .90, .72, and .77.

Rate was checked during the reading of four units in each grade. The rate units were not consecutive. Children were unaware of being timed. The rate was determined by having each child encircle the word being read at the instant time was called. Rate was not emphasized with the children.

The style preference was checked in grade IV and in grade VII by allowing free choice of style for each child. The teachers kept a careful record of choices each child made on all units. The reliability of style

preference selection was checked by correlating choices on even-numbered units with those on odd-numbered units. The coefficients of correlation were: grade IV, .82 ± .02; grade VII, .87 ± .02. The standard error of percentages was determined for the percentages on the more comprehensive tables.

Instructions and suggestions regarding the techniques to be used were carefully worked out and given to principals and teachers: (a) orally in a group meeting, (b) orally to individual teachers, and (c) on mimeographed typewritten sheets.

READING MATERIALS

Selections with a considerable amount of factual content were chosen from commonly used school texts and supplementary books. Publications from twelve leading school book publishers furnished the units finally used.

Each selected unit was rewritten in the other style so that there were paired versions of all selections—for each unit a conversational version and a narrative-expository version. Of these pairs, five of the originals at grade IV were in conversation, while at grade VII only two were originally in conversational style. Consequently, of the thirty-two units, a very large percentage of the rewritten articles were conversational in form.

Care was exercised to keep all rewritten units similar to the originals in vocabulary, sentence difficulty, factual content, and literary merit. Although the writer rewrote most of the units, several people assisted in the rewriting. From a total of thirty-eight rewritten units at grade IV and forty-three at grade VII levels, the writer selected twenty-two at grade IV and twenty at grade VII levels which he believed to be of similar worth. Four competent judges evaluated these units. The judges worked independently but were guided by the same specific instructions regarding criteria for evaluation. The judges compared the two style versions of each unit on the bases of: vocabulary, sentence difficulty, factual content, and literary merit.

The two versions of sixteen units at each grade level were estimated by the judges to be similar with respect to the above-mentioned characteristics. These units contained factual content largely confined to geography, history, nature study and science. The thirty-two selections so chosen were then printed in double columns on heavy bond paper, size 9″ x 12″. The type size used was: grade IV, 12 point; grade VII, 10 point. Check tests were printed on the same kind of paper and in type similar

in size to that used on the printed units. The following represent a few sentences taken from opening lines of each form on one unit.

CONVERSATIONAL FORM

"Oh, Mother, come see the big moon. It looks so big and close tonight." These were the words of Jane, a little girl of eight.

As Mrs. Jones, her mother, came to the window, she said, "It does look close and it is closer to the earth than any other planet, star, or sun. But even so it is a long way to the moon."

"But, Mother, it doesn't look far. Surely it wouldn't take long to go there if we had a good road and Daddy's automobile."

Her mother smiled and said, "If we went at sixty miles an hour, we would have to travel for a half year without stopping in order to get to the moon."

NARRATIVE-EXPOSITORY FORM

The moon is the nearest neighbor the earth has. It is much nearer than any planet, or star or sun. But is not very near.

If there were a road to the moon and we could travel there by automobile, the journey would take a long time. It would take us nearly half a year to reach the moon if the automobile went sixty miles an hour and we never stopped to rest.

SUMMARY OF FINDINGS

The data assembled in this study regarding the relative merits of conversational style and narrative-expository style of children's reading materials may be summarized as follows:

COMPREHENSION

Grade IV.—The comprehension results for grade IV, when viewed as a whole, seem to show a slight advantage to the narrative-expository version. However, the critical ratios are too small to allow statistical significance to be attached to mean differences of any combination of scores. The lowest critical ratio is .007 and the highest is 1.16. Some weight probably should be attached to the observation that of 21 comparisons made for grade IV scores (only 8 of which are independent of others), 18 differences were favorable to narrative-expository style. The comparison of all conversational scores for both halves of the experiment with all narrative scores shows the differences favorable to narrative with a critical ratio of .42. Although no differences are statistically significant, the fact that

the differences occur so consistently in favor of the narrative-expository version probably would justify the assumption that some real advantage for that style does exist.

Grade VII.—The comprehension data for grade VII, when the entire experiment is considered, favor conversational style. As in grade IV, the differences, when all scores on one version are compared with all scores on the other, are too small to be proved to be true differences with groups of the size used in this study. The critical ratio for boys and girls on the entire experiment (i.e., when scores on both halves of the experiment are combined, thereby utilizing the counter balancing effect of the rotation method) is 1.95 which, according to Garrett[1] indicates that the chances are 97 in one hundred that the difference is a true one. The groupings of scores for analytical purposes show the following: of the five differences favoring narrative-expository style, only one has a critical ratio of more than 1.48, that one being 2.26; while of the sixteen differences favoring conversation, ten have critical ratios of more than 2 and five have critical ratios above 3.

RATE OF READING

Grade IV.—The evidence relative to the effect of style on rate of reading indicates that grade IV pupils read faster when reading the conversational form. The differences favorable to conversation on the four units combined are statistically significant, the critical ratios being: boys, 4.73, girls 3.11, boys and girls, 4.90. Such large critical ratios practically assure to a certainty that the differences shown are true differences. The advantages of conversational style represented in percentages are: boys, 16.8 percent, girls, 11.50 percent, boys and girls, 12.9 percent.

Grade VII.—The reading rate of grade VII pupils seems to be about the same whether reading conversational style or the narrative-expository version. The rate for the three units combined shows a slight advantage to conversational discourse. However, the differences are too slight to indicate statistical significance. There is some consistency in the style favored when checked on the four combinations of scores. The critical ratios showing advantage to conversation are as follows: Unit VI, 2.00, Unit XVI, .64, and combination of all rate units, 1.02. The narrative-expository version of Unit XII, however, was read the faster by a differ-

[1] Garrett, Henry E. *Statistics in Psychology and Education* (New York: Longmans, Green and Co., 1926), p. 134.

ence in the means of 4.9 with a critical ratio of .96. It is probably safe to assume that neither style has any significant statistical or educational advantage over the other so far as rate is concerned, in grade VII.

RETENTION

Grade IV. — The amount of knowledge retained over a period of almost two months by grade IV children does not seem to be affected greatly by the form of writing from which the facts were learned. The differences in mean scores obtained from the retests have no statistical significance. However, from the 21 combinations of score groupings (only eight of which are independent of others), the differences somewhat consistently favor the conversational version. Since the small differences favorable to this style occur almost three times as often as for narrative-expository style, probably some justification may be found for the conclusion that there is a slight advantage in the former style. When all the retention scores for the entire experiment, based on conversational style, are compared with all the retention scores based on the reading of narrative-expository style, they further support the contention that there is some advantage in conversational discourse. The differences in the means of grade IV for this combination of scores favor conversation, with critical ratios as follows: boys, .66, girls, .85, boys and girls, 1.14.

Grade VII.—The effect of literary style on scores of grade VII pupils in the retention check tests shows differences in the means favorable to conversation. As with grade IV, the differences are too small to be significant from a statistical viewpoint. The differences shown do favor conversation, however, with only three exceptions, and these three differences are the smallest differences found on any comparison made. The much greater frequency with which the differences favor conversational style and the fact that differences favor this style when scores on the entire experiment are compared, would seem to indicate a slight advantage in its use.

CHOICE OF STYLE

Grade IV.—The relative interest in the two styles of writing as indicated by the choices made by grade IV pupils is favorable by a large margin to the conversational style. Of all the choices made by boys and girls in this grade, 69.9 percent were of conversational style. The percent of total conversational choices by boys is considerably less than in the case of girls. Preference for conversational style was shown to the extent of 63.5 percent by boys and 75.2 percent by girls.

When style preference is checked relative to the individual's choice, the preference for conversation is still predominant. This shows that 82 percent of grade IV girls chose conversational form more than half of the time and that 70 percent of the grade IV boys favored it more than half of the time.

Grade VII.—The style preference, as shown by free choice of grade VII pupils, is decidedly favorable to conversational style. The percent of total choices for boys and girls is almost the same as that for grade IV. A greater percentage of girls' choices, however, were for conversational style and a lower percentage of grade VII boys' choices were for this form. In other words, the sex difference was more pronounced in grade VII than in grade IV. The percent of total choices made by boys for conversational style is 54.8 percent while 83.4 percent of the total choices made by girls was for conversational style.

The individual pupil's style preference gives a decided advantage to conversational style. Eighty-seven percent of all grade VII girls chose this style more than half the time, while 61 percent of the boys showed a preference for it by choosing it a majority of the time.

SOME CONCLUSIONS BASED UPON FINDINGS

The findings of this study would seem to warrant the conclusion that factual content written in a conversational style deserves greater recognition by public school officials. Since children have demonstrated a preference for this style and are not handicapped by it in comprehension, rate of reading, or in retention of facts learned from reading, there probably is justification for claiming for it a larger place in children's content reading materials. No claim is made that conversational style should supersede the narrative-expository style, but the contention is made that it should be given a place along with the latter. Since most factual reading material at the adult level, however, is in narrative-expository form, training in habits and skills for this form must not be neglected at the elementary level. The preference for the conversation form may not be due to an appeal in the discourse itself, but to associations formed by certain experiences in reading. Possibly the child's recreational reading which is generally pleasurable may be associated with the conversational style, while the work type reading which sometimes is not so pleasurable, may be associated with the narrative-expository style.

The fact of increased length of conversational versions should be noted. To increase the number of words in a selection, as is likely to be true in

conversational versions, is to increase the cost of publication and possibly to increase the length of time consumed in reading. The conversational versions used in this study had on an average approximately 20 percent more words than the other style. However, an increase in word rate of reading, as found particularly at grade IV, will tend to counter-balance time lost in reading a longer conversational version.

The sex difference, so far as style preference is concerned, deserves consideration by teachers of reading and by educators generally. That girls at the level of grade VII predominantly prefer a conversational style and that boys as a whole at this age have no decided style preference seems significant. If interest is an important factor in educational work, and if we assume that free choices regarding style are based on interest factors, then conversational style, for grade VII girls in particular, is eminently more valuable. There is reason to believe that a child will read much more if interested. More reading is likely to bring more knowledge and greater appreciations. The element of increased pleasure from reading the more interesting style is probably important from the point of view of developing favorable attitudes toward reading. Teachers knowing the sex difference relative to style preferences should more nearly meet the needs of boys and girls at these grade levels.

RESEARCH STUDIES IN WORK TYPE READING: A SUMMARY OF WORK DONE AT ONE UNIVERSITY

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THE studies summarized in this paper are selected from a considerable number of researches conducted for the purpose of satisfying the requirements for the master's or doctor's degree at the University of Pittsburgh without any intention of giving a chronological report or a complete account of all the studies available but rather with the purpose of showing the effect of research concentrated on certain problems that have to do with work-type reading.

The interest of the writer in work-type reading has led him to direct many students in their investigations in this field. A study made with the coöperation of the teachers of Johnstown, Pennsylvania, on *What Children Do When They Study*[1] seemed to show that children as immature as those in the third grade have some ability to enumerate their study activities. It was shown too that pupils are able to enumerate their study habits more accurately as they mature. The study showed that by the time the pupil reached the seventh or eighth grade his study patterns resemble those of junior college students as reported by Charters.[2] At the same time, the patterns revealed are far from satisfactory for a vast majority of pupils in the middle grades and raise such questions as, "How do pupils study different subjects?" "What is the effect of certain typographical features of the printed page on comprehension?" and similar questions, many of which have never been answered.

One attempt to answer the question of how children study a subject is reported by Gibson.[3] Using a technique similar to that employed by the writer in the Johnstown study, Gibson tried to discover what the study patterns of pupils in attempting to assimilate material in this field were. He first used the device of having the pupils write a paragraph in which they told what they did in studying a history lesson. These papers were

[1] Yoakam, G. A. "What Children Do When They Study," *University of Pittsburgh School of Education Journal*, I, November-January, 1925-1926.

[2] Charters, Jessie Allen. "How Two Hundred and Fifty-Eight Junior College Women Study," *Journal of Educational Research*, XI (January, 1925), pp. 41-49.

[3] Gibson, C. G. *How Do Pupils Study Historical Materials?* M. A. Thesis, *University of Pittsburgh*, 1931. Filed in the University of Pittsburgh Library.

tabulated to discover the items which specifically represented study activities. From the first tabulation a checking list was made. This was referred to the pupils for verification and for such additions as they could make. This same list was submitted to seventeen teachers for checking in order to see whether or not the teachers' methods of work had any resemblance to those of the pupils. The study revealed that there is a marked agreement among children as to the activities in the study of history. The most frequent activities used by children in grades four to eight are *reading the lesson once, answering questions given out by the teacher, picking out important names, re-reading the assignment, studying maps, and using the index.* The study shows that teachers follow the same general scheme as pupils and that pupils do more than merely read and memorize when they study history. This may be due to the emphasis placed upon work-type reading in the schools in recent years. The study also suggests that the question of how well the pupils perform the various activities is not touched upon by the study and that it should be investigated. This type of study has some value in educational guidance, as was pointed out by Brewer[4] in his *Cases in the Administration of Guidance.* The study has all the limitations of the interview-questionnaire technique. As far as the writer can see, however, it offers suggestions to the teacher and the supervisor which are perhaps as much by implication as by the actual data.

Another type of study which employs the technique that is probably most frowned on by certain research workers and most employed by others, is a doctor of education dissertation reporting an investigation of home study practices in Western Pennsylvania by W. Ray Smith.[5] Although previous studies had been made on this general subject Smith's investigation is more comprehensive than others. Questionnaires were sent to three groups: (1) 10 principals and 369 teachers; (2) 179 parents; and (3) 559 pupils. This study gives the teacher or administrator an insight into the current beliefs and practices about this important subject which apparently is the pet hate of pupils, is believed in by a majority of

[4] Brewer, John M. *Cases in the Administration of Guidance* (New York: McGraw-Hill, 1929), pp. 34-36.

[5] Smith, W. Ray. *Home Study Practices in Elementary Schools of Certain School Districts in Western Pennsylvania.* Doctor of Education Dissertation, 1933. Filed in the University of Pittsburgh Library. Abstract: *University of Pittsburgh Bulletin,* XXX (November 15, 1933), pp. 248-53.

teachers, and by a large majority of parents. It appears that neither principals nor teachers believe in assigning home work before grade three. The study shows that the majority did not believe it ought to be assigned in grade four, but there was agreement that it is desirable in grades three, five, six, seven and eight. A majority of teachers agree that pupils should not be prohibited from doing home work if they choose. Teachers favor making home work assignments short—twenty minutes in lower grades and not over an hour in the upper grades. Teachers and principals are agreed that home work should be assigned for specific purposes and that the practice of assigning home work should strengthen certain habits and traits, such as responsibility, neatness, and self-reliance. A majority of teachers and principals believe that home study has a favorable effect upon the home. Teachers and principals are agreed that checks should be made on the work done at home. The methods of assigning home work used by teachers vary with the grade and subject taught. Detailed rather than general assignments are favored, and written assignments rather than oral. Practices which are most appropriate for home study are reading, reviewing subjects taught in class, making scrap books, collecting pictures, notebook work, handwork, drawing, writing, spelling, and writing original stories. It is also of interest that the study, which was made in 1933, showed little adoption of the activity methods of teaching among the group investigated. The most used method was practice or drill. In the intermediate grades the problem or project method was used most frequently, while the textbook and activity methods were employed rarely except in the higher grades. The study seems to show that Western Pennsylvania takes work seriously and that teachers are still largely conservative and spend a great deal of time with and place great emphasis upon drill. One may well question, however, whether or not the pupils who do so much home work in so many schools know how to work effectively with books.

A second study of home work, which of course is the real test of the ability of pupils to read and study independently, was made by Klinko.[6] This study was conducted in a town in eastern Ohio and involved 827 elementary school pupils in grades four to eight. The pupils were interviewed by teachers who used a prepared questionnaire. Klinko says:

[6] Klinko, Andrew S. *An Appraisal of Home Assignments Made in Grades Four to Eight.* M. A. Thesis, 1933. Abstract in *University of Pittsburgh Bulletin, XXX* (November 15, 1933), pp. 396-7.

"In spite of the fact that teachers felt that school-prepared assignments were better than home-prepared assignments, they continued to favor the practice of assigning long lessons most of which had to be done at home. More than half the assignments made by teachers are done at home, according to the pupils.

"About one-third of the teachers favored abolishing all home work in arithmetic and language.

"About one-fourth of the pupils indicated that they have no time for home work because of other duties. Eighty percent of the pupils have no reference books or materials at home. Assignments in general were oral and provided very little for individual differences.

"It was found that a large amount of home work was being assigned in intermediate grades. Slightly more than one-half of the teachers made regular assignments in arithmetic. One-third made regular home assignments in geography and history. Many made occasional assignments in reading, spelling, and language. Arithmetic home work was done best, according to the teachers. Pupils had most difficulty with home assignments in geography.

"Pupils, it was indicated, do not find it difficult to get home assistance. They also seem to feel that their assignments are satisfactory. There is no question but that many of them have great difficulty in doing their home work satisfactorily. A majority of the pupils feel that school-prepared assignments are done better than home-prepared assignments. There was no general expression against the practice of home work. On the contrary, pupils rather favored it. Since the teacher interviewed the pupils, the question arises as to what extent the pupils express their ideas freely. One might hesitate to accept pupils' opinions on teaching procedures."

It is noteworthy that there is an apparent conflict in one important particular with respect to home work between Smith's and Klinko's study, probably chargeable to the method used in the latter. Pupils do not like home work, according to Smith; they do like it according to Klinko. The fact of the matter is that whether they like it or not will depend upon what kind of work is asked for, how it is assigned, and how successful they are in doing it. It is also to be noted in each of these studies that there is no suggestion that teaching is any other than assigning work and having pupils prepare it. The studies give interesting cross sections of current practice and suggest a great need for attention to the work-type reading and methods of study if pupils are to continue to spend much of their time in getting vicarious experience from books. There is, of course, no intention here of suggesting that application of the mind to books is not a very important aspect of learning. As long as teachers are comparatively untrained, pupils will continue to get much that they learn from books, and

it appears that in the new-type school children will read more than in the old. A projected study by Pacella proposes to push the matter further and find out just how parents help children when they study at home. Many workers feel that parents probably hinder as much as they help. Pacella hopes to be able to find out whether or not this is true. An unfinished study by Long of the methods used by children in studying spelling at home will probably give us much light on the question of whether methods of study taught in school transfer to home study.

Such studies as the preceding give information only about general practices and procedures. They tell us little of what happens as the child sits inert trying to assimilate ideas from the printed page. The writer personally has attempted to get some light on this problem by having adult students analyze their own study procedures. Parenthetically it may be remarked that Hathaway in an unpublished study gathered some suggestive material on the same subject from children. Undoubtedly study patterns vary considerably with individuals, but if it were possible to get patterns of various types of study as performed by many competent persons it would be possible to improve the study habits of children enormously by fitting and adapting patterns to the needs of children, and training them to adopt and use good patterns of work. It is appalling how little is known about this matter at the present time.

The problem of attacking and assimilating the ideas presented on the printed page is extremely complex. Much has been done with respect to the mechanical problems, such as length of line and size of print. There still remain such problems as punctuation and length of sentence, length of paragraphs appropriate for pupils at given levels, and the complexity of the concepts which may be understood by pupils of different degrees of mental maturity. Students at the University of Pittsburgh have attacked some of these problems.

Thompson[1] attempted to find the effect of the length of sentence upon comprehension. She employed the equated group method with 1400 fifth and sixth grade children. Groups were equated on the *Monroe Standardized Silent Reading Tests Revised*, Form I. The material used for the experiment was a lesson from McCall and Crabbe's *Standard Test Lessons in Reading*, Book 4. This lesson was prepared in three forms: long sentences, short sentences, and as prepared by McCall in the original. The

[1] Thompson, Ruth C. *The Effect of Length of Sentence Upon Comprehension.* M. A. Thesis, 1929. Filed in University of Pittsburgh Library.

standard lesson contained 299 words; the long sentence version, 300 words; and the short sentence version, 299 words. The results of the experiment showed no reliable difference among the scores made on the three versions as determined by a three minute test. These findings confirmed those of Orndorff[8] in an earlier experiment. While Thompson's experiment involved more pupils and was better controlled than Orndorff's, there still remain such questions as, "Would the same results hold on much longer material? What is the effect on rate of the long sentence?" etc. Data seem to show, as cited by Thompson, that standard authors run to long sentences, ranging from 36.42 words in Hawthorne to 18.75 in Cather. Undoubtedly there remain a host of interesting experiments to be performed with material of various types before definite conclusions can be reached with respect to this matter. Such data as we have seem to indicate the necessity of sentences of gradually increasing length. Practices vary tremendously, however. Sentence length is so involved with style that it is questionable if it should be controlled and if the works of great writers should be mutilated to make them palatable for children of a given age.

The effect of punctuation upon comprehension is an equally interesting problem. This problem was attacked by Townsend.[9] He conducted a four-part rotation experiment, using 75 children in each group from the eighth grade. One form of the Thorndike-McCall Reading Test was used, changed in such a way that one version represented normal punctuation, one was excessively punctuated, one partly punctuated, and one without punctuation. These four versions were rotated among the four groups. The tests were given one week apart. Here again the results seem not to agree with the common belief, for they show no reliable differences. The writer cannot account for this fact unless, as in Townsend's experiment, the material was not long enough to compel a single reading and the pupils were able to reread until they had puzzled out the meaning even without the aid of punctuation. It is of course true that today the tendency is to include only that punctuation necessary for comprehension. It is possible that in reading the child is unconscious of punctuation and that capitalization gives him all the aid he needs to get the meaning. At any rate this problem challenges the writer. Further study is necessary here.

[8] Orndorff, Bernice. *An Experiment to Show the Effect of Length of Sentence Upon Comprehension.* University of Iowa Thesis, 1925.

[9] Townsend, George W. *The Effect of Punctuation Upon Comprehension.* M. A. Thesis, 1930. Filed in University of Pittsburgh Library. Abstract in *University of Pittsburgh Bulletin,* XXVII (November 15, 1930), pp. 398-399.

A projected study by Graham may also be of interest in connection with the same general problem of the effect of forms of various kinds upon rate and comprehension. Miss Graham is now undertaking a doctoral study to measure the effect on comprehension of print, manuscript, and cursive forms. She will use individual photographic measurement as well as group measurement in her experiment.

A study by Dean[19] attempted to get at the problem of the nature of comprehension among a group of children at the fourth grade level. While limited in character, the experiment suggests an important problem. Dean used standardized test material with a wide range of difficulty in order to measure extremes at the ends of the scale. The children tested were in selected groups. The material used was taken from *Standard Test Lessons in Reading* by McCall and Crabbe. Samples were selected from these lessons in order to test a wide range of ability. Types of comprehension were determined by expert judgment. These types were: reading for the main points; reading to reorganize the material; reading to judge the relative importance of ideas; and reading to draw inferences from facts not overtly stated. In all 245 children in six different schools were tested. Pupils were divided into two groups. In Group I the range of comprehension was tested. In Group II the types of comprehension were studied. Tests in Group I were three minutes in length; in Group II the time was not limited. The mean grade score was found to be 4.7 grades, identical with the standard for the tests. The range in mental age of the pupils was from 14.7 to 7.5 years. The range in grade scores was 4.5 grades. The coefficient of correlation between mental age and grade scores was $.50 \pm .07$. All children except the very bright have more trouble with type four than any other type of comprehension. The order of difficulty of the types of comprehension studied is as follows:

1. Reading for the main points—factual answers.
2. Reorganizing material.
3. Drawing inferences from facts overtly stated.
4. Judging the relative importance of various facts.

This study opens the question of determining the relative difficulty and the proper gradation of different types of exercises in comprehension. There are many possible variations of the study. When we know more about them we shall know more about the gradation of reading material.

[19] Dean, Alice M. *A Study of the Range and Types of Comprehension in Fourth Grade Reading.* M. A. Thesis, 1932. Filed in University Library. Abstract: *University of Pittsburgh Bulletin*, XXIX (January 10, 1933), pp. 319-20.

Another problem of work-type reading which has interested the writer for some time is the problem of repetitions in reading. In the mastery of ideas the common method employed by the inexpert reader when he wishes to memorize ideas is to read over and over again. Coulter[11] attempted to find out just how effective each repeated reading is. Yoakam and Good had shown previously that the second reading adds something, but not a great deal, to the first. Coulter, using factual material geographical in character with fourth-grade pupils, tested the effect of five repetitions, using both the rotation method and control group method. When she paired her groups of pupils, she found an increase in scores from first to fifth reading as follows with a single relapse in the scores on the fourth reading:

No. of Readings	1	2	3	4	5
Percent of Correct Answers	53.4	53.9	62.6	57.3	66.5

These scores represent the percent of correct answers on five readings of the materials. Coulter found that the bright pupils increased their scores from first to second reading about nine percent; from second to third reading, not at all; from third to fourth reading, five percent of the total possible score; and from fourth to fifth reading, no increase. The middle fifty percent of the pupils had a relapse on the third reading and did not increase their scores appreciably on the third, fourth, or fifth reading. The lower quarter made their highest score on the fourth reading; they showed a great deal of fluctuation in scores. The first quartile averaged 84.4 percent on the fifth reading; the middle fifty percent, 64.3 percent; and the lower quartile, 34.4 percent. It should be pointed out that the reliability of the scores was not determined by the experimenter. These data confirm the writer's belief that if we had a complete learning curve on this basis we should have a steady upward trend among the bright pupils, and fluctuations among the middle fifty percent and the lower quartile. Coulter's study confirms the findings of Yoakam[12] and Good[13] with respect to the effectiveness of repetition in securing comprehension. It seems apparent that in reading for comprehension straight re-reading

[11] Coulter, Merle A. *The Effect of Repetition on Comprehension and Retention in Reading.* M. A. Thesis, 1928. Filed in the University of Pittsburgh Library.

[12] Yoakam, G. A. *The Effect of a Single Reading.* University of Iowa Studies, II, No. 7, March 15, 1924.

[13] Good, C. V. "The Effect of a Single Reading Versus Two Readings of a Given Body of Material," *Journal of Educational Method,* V (April, 1926), pp. 325-29.

is relatively ineffective and that learners vary greatly in this respect, the bright exceeding the dull in this ability in the same way that they do in any other situation where reasoning and judgment are involved. Dr. S. A. Courtis once suggested to the writer that the best way to attack this problem of single as compared with repeated readings, would be to use hypnosis and then get from the person in an hypnotic state as much of a perfect reproduction as possible after a single reading, a repeated reading, etc. It seems, on the whole, that the curve that would be obtained under ideal conditions would be the characteristic learning curve beginning not at the zero point, but at some point ranging from a score of twenty-five percent of the ideas, or lower, to eighty percent of the ideas, or more.

Another study which seems to the writer to be of considerable interest is that by Eckert.[14] Mrs. Eckert attempted to get some data on the effect of context on the comprehension of words. Obviously Meumann and Ebbinghaus well knew that words together mean more than they do separately. After many years of trying to teach the meaning of words in isolation, we seem to have realized that the ideal setting of a word is in a sentence or paragraph, with the possible exceptions of such words as ENTRANCE and EXIT, STOP and GO, and others of similar import. Even they have an appropriate context.

Eckert's study was carefully conducted. Two tests were made up of words taken from three readers used in the third grades of the Pittsburgh schools. These words were selected as difficult by the combined judgment of ten third-grade children and twenty-five primary teachers. The words were then checked against the Thorndike and other lists to determine their frequency of use. Fifty words were thus compiled and checked. These words were made into two tests—a word test and a sentence test, containing the same words used in the sentences of their regular context. Great care was taken in constructing the response words for the tests. Each response contained one synonym, one word unrelated in meaning, sound, or appearance, and one word similar in sound and appearance. The word test and sentence test were administered to the same group of 312 pupils in the fourth grades of four Pittsburgh schools. Pupils were paired on the Thorndike-McCall Reading Scale, Form 3. T scores or reading ages and reading quotients were used in pairing the pupils. The two tests were given in different order to the paired groups. The results of the study are convincing. Scores on the sentence test on the whole average 4.6 ± .52

[14] Eckert, Molly H. *The Effect of Context on Comprehension of Words.* M. A. Thesis, 1928. Filed in University of Pittsburgh Library.

higher than those on the word test. The difference is eight times the probable error of the difference. The difference is 5.9 ± .77 for the upper quartile, 4.6 ± .60 for the middle fifty percent, and 3.8 ± .66 for the lower quartile. This suggests that the interpretation of meaning from context is a matter of judgment and reasoning in which brighter pupils are naturally more proficient than others. A further study of the data reveals that, as might be expected, the pupils were not invariably helped by the context. In the case of test items constituting twenty percent of the sentence test, pupils were more hindered than helped by the context. This tends to suggest that the problem of the recognition of meanings from context is complex and depends upon the nature of the context involved as well as on modifying effect of contiguous words or phrases. Eckert suggests that her data simply confirm the statements of Huey,[15] Jones,[16] Gray,[17] and others, and verify the earlier data collected by Smith[18] and Mosher[19] incidentally as they studied other problems. It is fair to say that in spite of the data already collected there is a rich field here for further investigation.

Pursuing further the study of factors involved in work- or study-type reading, Snyder[20] conducted an experiment in which he attempted to determine whether pupils comprehend and retain more when reading material in story form than in factual form. He used an article written in two forms about money, one form consisting of straight-forward exposition and the second a story containing the same facts but presented by the device of conversation, and carried on by fictitious characters after the manner of *Uncle Robert's Geography*. His findings confirmed studies reported at a slightly earlier time by Garnett[21] and confliet with the general findings of the study by McKee.[22] Snyder found that, while pupils pre-

[15] Huey, E. B. *Psychology and Pedagogy of Reading*, p. 161.

[16] Jones, R. G. "Standard Vocabulary in Reading," *Fourteenth Yearbook*, National Society for the Study of Education, p. 43.

[17] Gray, W. S. "Relation of Reading to Economy in Education," *Sixteenth Yearbook*, National Society for the Study of Education, p. 31.

[18] Smith, Nila B. "The Construction of First Grade Reading Material," *Journal of Educational Research* (February, 1928), p. 82.

[19] Mosher, R. M. "Some Results of Teaching Beginners by the Look-and-Say Method," *Journal of Educational Psychology* (March, 1928), pp. 191-2.

[20] Snyder, Edwin D. *Factual and the Story Form of Presenting Reading Material.* M. A. Thesis, 1928. Filed in the University of Pittsburgh Library.

[21] Garnett, Wilma. "Factual Versus Story-Factual Material," *Elementary English Review* (January, 1926), pp. 268-71.

[22] McKee, Paul. "Fact Form and Story Form Reading Material," *Elementary English Review* (January, 1926), pp. 3-8.

ferred story material, they got the facts just as well from the factual material. Moreover, on delayed recall tests 60 days later the same result held. We are faced then with inconclusive evidence in these three studies, although McKee's study is more comprehensive and he concludes that as far as comprehension and recall are concerned the factual form is more effective, since it takes a shorter time to read. It seems quite probable that, since story telling is an old art and since people are first of all human, children will continue to prefer stories when they can get them in spite of the possible efficiency involved in getting facts in straight-forward exposition. The intangible factor of style remains a baffling problem. Obviously there is still much to be done here. If authors and publishers knew invariably the secrets of a best seller, there would be far fewer failures in the writing and publishing fields.

Several other studies have a bearing on the problem of work-type reading. One of these by Hathaway[23] attempts to find out the purposes that lead adults to read. These purposes can probably be classified as of two general types, leisure and vocational purposes, with perhaps an area where these purposes are so mixed as to be indistinguishable. Hathaway's study revealed 4,212 specific purposes that lead adults to read. Undoubtedly some of these purposes are appropriate for children to follow. The classification of these items leads to a set of fundamental purposes which guide adults in their reading. A study by Gatto[24] adds important data to our knowledge of pupils' questions and relates questioning to the study process in an interesting way. French[25] and Simpson[26] wrote dissertations reporting experiments in which they measured the effect of training in organization and other factors in work-type reading, showing the advantages of such training in general. Cooper[27] made an extensive study of the

[23] Hathaway, Gladys M. *The Reading Purposes of Adults.* Ph. D. Dissertation on file in the University of Pittsburgh Library. Abstract: *University of Pittsburgh Bulletin,* Vol. 30, No. 2, November 15, 1933.

[24] Gatto, Frank M. *Pupils' Questions: Their Nature and Their Relationship to the Study Process.* Ph.D. Dissertation, 1929. Filed in University of Pittsburgh Library.

[25] French, Lloyd C. *The Effect on Achievement in Geography of Specific Training in Vocabulary; the Reading of Maps, Graphs, and Tables; and Organization.* Ph.D. Dissertation, 1932. Filed in the University of Pittsburgh Library.

[26] Simpson, R. G. *The Effect of Training in Organization on Ability to Read Historical Materials.* Ph. D. Dissertation, 1928. Filed in the University of Pittsburgh Library.

[27] Cooper, Elizabeth E. *An Investigation of the Reading Interest of One Thousand Adult Occupational Workers.* Ph. D. Dissertation, 1931. Filed in University of Pittsburgh Library.

reading habits of adult occupational workers. Truby[28] surveyed current practices with respect to training exercises in work-type readers.

Comments on these and other studies will have to be reserved for some future time. Enough has been reported, however, to show that when research studies are grouped around certain problems and interests, data accumulate rather rapidly. While in the present case there is no claim that this series of investigations was consecutive in nature or that it represents a deliberately planned research project with various subdivisions, this report tends to contradict the statement sometimes made by critics of research in American universities that investigational activity is not coördinated and that it results in scattered effort. Probably several American universities could present data to confute such an assumption and to support the idea that much is being accomplished through educational research in certain fields to define and locate problems and clarify thinking, even if the final solutions to the problems are still in the offing.

[28] Truby, Charlotte C. *An Analysis of the Training Exercises in Certain Silent Readers for the Intermediate Grades.* M. A. Thesis, 1928. Filed in the University of Pittsburgh Library.

REVIEWS

Address all communications relative to book reviews to Editor Kai Jensen, University of Wisconsin, Madison, Wisconsin.

FRY, C. LUTHER. *The Technique of Social Investigation* (New York: Harper and Brothers, 1934), pp. XIV + 316.

It may be said of the more general books on investigational procedures in education that they have been rather brief and incomplete, while the specialized volumes devoted entirely to a single area such as tests, statistical methods, the school survey, the questionnaire, historical research, experimental research, the interview, case work, etc., have covered only a limited portion of the field of research methodology. A similar statement may be made of most of the available discussions of research techniques in the fields of sociology and psychology. Another characteristic of the majority of books on investigational procedure is that no adequate differentiation is made with respect to the part played by various research techniques in problem solving. That is, basal methods for attacking problems (such as historical, experimental, and survey techniques), devices or instruments for collecting data (questionnaires, check lists, score cards, rating scales, tests, etc.), statistical tools for analyzing data, and philosophical procedures (especially useful in evaluating results) frequently are treated as parallel research techniques, without making clear the relationship to the various steps in problem solving.

This new book is intended primarily for workers interested in social investigation, with particular reference to sociology. It is in a large measure the result of the author's experience in connection with the Institute of Social and Religious Research. A commendable feature of the volume is an attempt to make the organization and sequence of the chapters conform to the steps involved in initiating and carrying through to completion a reliable inquiry. An opening chapter deals with the selection, delimitation, and statement of the problem. Next comes a sixteen-page discussion of "Consulting Available Sources," which covers the canvass of related literature and historical materials, as related to sociological problems. This treatment will seem rather sketchy to many workers in education who maintain that the technique of making a thorough canvass of related investigations should be outlined in considerable detail and a thorough separate discussion given to historical research.

Succeeding chapters deal with direct observation, the interview, questionnaires, schedules, and tests as ways of collecting data for the solution of problems. The reviewer's reaction is that the case method, which is discussed briefly in the chapter on the interview, might well have been given more space in a separate chapter, in view of the importance of case studies in sociology. Another impression is that direct observation, interviews, questionnaires, and tests might have been considered different phases of, or data-collecting instruments for, a normative-survey type of investigation, which after

all is the basal or fundamental research procedure involved. The chapter on tests includes five pages devoted to the topic of experimentation, which might well have been given more space in a separate chapter in view of its possibilities as a major approach to problem solving and as the classical method of science, in spite of difficulties present in controlling variable factors in the field of social investigation. It seems hardly logical to consider experimentation and tests together, since the latter are merely instruments for collecting data, to be used in normative-survey investigations, to equate groups or to measure progress in experimental studies, in case studies, etc. A chapter on "Combining Methods of Study" is concerned primarily with the social survey, which of course frequently involves a number of other investigational procedures such as those enumerated above. Other topics include: carrying forward the study (after the investigational method has been selected), qualitative and quantitative analysis of data (the latter in particular involving the use of statistical concepts), writing the report, disseminating and applying the findings, and possibilities and limitations of social research.

The book is much briefer and less complete than certain available volumes in the social science field, especially those by Odum and Jocher and by Spahr and Swenson, although an excellent bibliography of 62 pages is provided. The style is direct and almost conversational in nature. A number of interesting examples of the various types of research are given with appropriate documentation. The reviewer wishes, however, as indicated in preceding paragraphs, that the classification of research procedures had been worked out along somewhat more fundamental lines, with adequate differentiation between major approaches to problem solving and other techniques such as devices for collecting or analyzing data, and that more space had been given to historical, experimental, and case methods.

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SEGEL, DAVID. *Differential Diagnosis of Ability in School Children* (Baltimore: Warwick and York, 1934), pp. VII + 86.

The author of this little book is Educational Consultant and Specialist in Tests and Measurements, United States Office of Education.

The author is interested in the development of techniques for discovering individual strengths and weaknesses. The use of such techniques on individuals and the interpretation of results he calls "differential diagnosis." He says, "Differential diagnosis makes possible a more accurate program of remedial instruction and guidance of pupils into channels in which they will be successful." (p. 10) Mass education, he believes, "tends to level a child's gifts and deficiencies into a monotonous plane." The discovery of strengths and weaknesses in children is necessary in order that we may know what remedial instruction to apply and also that we may provide accurate educational guidance. Strengths as well as weaknesses should have attention so that the children may have an opportunity to grow in the things in which they have special aptitudes.

Two major problems are recognized and a chapter is devoted to each. The first has to do with the determination of the efficiency of tests to make a differential diagnosis. Obviously, it is useless to undertake to make a differential diagnosis from the scores of a child on tests if the adequacy of these tests for making the differential diagnosis has not been determined. The efficiency of tests in mak-

ing a differential diagnosis is evaluated in two ways. One is through the comparatively simple expedient of correcting correlation for attenuation. The other is through the use of a method developed by Kelley and published twelve years ago. The Kelley method determines the ratio of the standard deviation of a difference for a given pupil, using standard scores, to the standard deviation of differences in a distribution, also expressed in standard scores. The former of these standard deviations is obtained by subtracting the sum of the reliability coefficients of the two tests under consideration from 2 and extracting the square root of the remainder. To obtain the latter standard deviation, find the correlation between the two tests, multiply by 2, subtract the product from 2, and extract the square root of the remainder. The smaller the resulting ratio, the better the tests for differential diagnostic purposes. A table, the origin of which is not explained, provides for the interpretation of these ratios in terms of the proportion of differences which are in excess of chance. If the differentiating power of two tests is less than 25 percent, the tests should not be used in differential diagnosis.

The second major problem is the treating of test results to make a differential diagnosis. There are two methods of accomplishing this purpose. One is to interpret the difference between the scores of an individual on two tests in the light of the probable error of this difference. Methods of accomplishing this, adapted from Kelley, are given and illustrated. The second method, also developed by Kelley, makes allowance for variation differences by assuming equivalent standard deviations through the use of standard scores. For two tests, then, the probable error of the difference is calculated from the reliability coefficients of the tests; the difference expressed in terms of standard scores, is divided by this probable error; and the resulting ratio is interpreted in the usual way.

In addition to the two chapters dealing with these two major problems, there is an introductory chapter in which the general program is outlined and a final chapter in which available tests and measurements are listed and discussed.

The reviewer presumes that Mr. Segel's purpose in writing this book was to popularize techniques already available but not known to very many persons. This is a laudable purpose. Methods of differential diagnosis here described should be much more widely known and more widely used by both test makers and test users than is the case at the present time. In the opinion of the reviewer, this purpose would have accomplished more successfully, had a somewhat more elaborate account of the methods been provided and had the techniques been more richly illustrated. In places, a simpler and more easily read account could have been provided. Trained research workers will read the book, will understand it, and will probably use its proposed methods. But the reviewer's experience in undertaking to teach statistics to graduate students in three institutions leaves him with the conviction that the majority of them will be unable to read Mr. Segel's book profitably without the aid of a teacher.

A few typographical errors should be corrected before another printing is issued. The omission of a complete line from a quotation, for example, makes the quotation have but little meaning for the reader.

The book will be a most welcome addition to the libraries to many persons interested in individual pupil diagnosis.

R. L. MORTON

Ohio University

GUTHRIE, EDWIN R. *The Psychology of Learning* (New York: Harper and Brothers, 1935), 258 pp.

This is one of the most entertaining discussions of the problems of learning that can be found. Written in a simple, conversational style, packed with home-spun illustrations, it should have a wide appeal because there is meat in it for everyone from the man on the street to the critical specialist. The keynote of the book is that behavior must be explained in terms of the individual's past history and that the conditional response principle is a broad underlying principle which can be used to interpret all the major problems of learning. Although the argument leads the author inevitably into a direct clash with the Gestalt and Teleological points of view, he is never offensively partisan, and his arguments are couched in such lucid terms that the reader cannot fail to grasp, whether he accepts or rejects, them.

Guthrie's interpretation of the conditioned response principle needs clarifying. It is much broader and looser than that of Pavlov's conditioned reflex. His formulation is as follows: "A combination of stimuli which has accompanied a movement will, on its recurrence, tend to be followed by that movement." It is stated independently of any assumptions regarding nerve physiology. It is inclusive of, rather than supplementary to, the principle of association. He has injected into the concept certain unique assumptions, chief of which are (1) that it is the stimuli occurring *as the response occurs* that are the future cues for the response; hence all conditioning is *simultaneous*, it is not the conditioned and unconditioned *stimuli* that are associated, but the total complex of movements involved in responding to the secondary stimulus that are associated with the primary response and are the conditioners of it. (2) The conditioned is never identical with the unconditioned response, because the total complex of movement stimuli is never again the same. The first assumption removes the problem of backward conditioning, since it probably involves actual coincidence of real cue and response. It also removes the discrepancy between conditioned reflex and associative learning, as to the time gap that may occur between associated terms, because, in the latter, the verbal response is the real conditioning cue. It accounts for transfer and generalization, since the movement stimuli which are the real conditioners, may be the same and hence set off the same response even though the so-called conditioned stimulus is different.

A third feature of Guthrie's treatment of the conditioned response principle relates to the facts of repetition or frequency of pairing. The law of frequency is not a fundamental characteristic of conditioning. Its supposed effects are explained rather as the addition of more conditioners.

The pleasure-pain hypothesis, in its modern garb as Thorndike's satisfier-annoyer interpretation of the law of effect, is brought under the general principle of conditioning by Guthrie when he says, "It is not the annoyance, but what the annoyed person does that determines what will be learned." Annoyance means increased muscle tonus and "from learning to do whatever is done in response to whatever cues are present,"

As to the problem of motivation Guthrie subsumes it under conditioning. "Many psychologists," says he "conceive of the goal as the determiner of the learning." But until the goal has been experienced, it is not an *antecedent*, hence cannot cause learning. He agrees with Hull that the apparent 'drawing power'

of the goal is based on the conditioning of cues for successful movement. The role of "intention" in learning is described as consisting in a body of maintaining stimuli — action tendencies conditioned during past experience.

The treatment of perception and thought follow orthodox behaviorism. "There is no clear line between thought and action." Some peripheral activity is necessary to furnish movement-produced stimuli capable of carrying on the thought train.

The book contains many practical points regarding the making and breaking of habits, etc., for the benefit of the general reader. Occasionally an obviously onesided opinion is passed off as universal, as when the author declares that the learning curve, like the forgetting curve, is no longer taken seriously.

It is very difficult to attack Guthrie's point of view, because it is so general. Any associationist could easily subscribe to most of it and remain an associationist of the motor variety. But in the detailed applications of his theory he has thrown out many excellent suggestions which are fresh and thought provoking.

A. G. BILLS

University of Chicago

MULHERN, JAMES. *A History of Secondary Education in Pennsylvania* (Philadelphia: The Author, 1933), pp. XV + 114.

This book is a notable addition to the historiography of American education. It treats its topic from the earliest beginnings to the end of the nineteenth century; and as educational differentiations were not very clear and sharp in early times it also includes some information on elementary education. In Pennsylvania as in most of the older states the subject falls naturally into three divisions: the colonial period which the author carefully refrains from calling the period of the Latin Grammar School probably because realistic tendencies were strong in the state from the first; the period of the academy; and the period of the public high school.

The book has several features which should be listed. First of all, not only is it written from the original sources, both manuscript and printed, and always well documented, but many of the sources are actually incorporated in the text either wholly or in part. Most of the score of illustrations, also, are facsimiles of documents. The author relates the history of schools and teaching to the general history and social development of the state. Attention is given to the economic, political, religious and other aspects of each period. Since Philadelphia has been an important scientific center from colonial times it is rather surprising that so little attention is paid to the scientific and intellectual climate and especially so in view of the decidedly realistic learning of the author. Of course even a reviewer knows that one book cannot contain everything; but to the present one it would seem that the intellectual climate should have had some of the attention given to the political temperature of the Revolutionary era.

A third feature of the book is the attention paid to the developing secondary education for girls. This is a topic which Thomas Woody who, so the author says, inspired this study has made peculiarly his own. It is also a topic which has been all but ignored in the textbooks on the history of education in the United States. Each of the divisions of the book has a summary chapter dealing with curriculum, method and purpose of education in the period under discussion. This might be called the fourth special feature.

Some of the special conclusions of the book may be indicated. The author has added a large number of private schools to the list which was known before; and he has shown that the private school teacher was more responsive to educational demand than those who had charge of endowed and public schools. He has shown that in Pennsylvania, as elsewhere, a great many academies were transformed into public high schools. Whether this supports his own conclusion (p. 602) that, "Almost universally, our high schools arose as a gradual extension upward of the common school" we have not space to consider. His excellent treatment of the developing of public opinion as it bore upon educational questions is illuminating and shows in particular how difficult it was for the public high school in Pennsylvania to win public support. He has thrown new light upon the student activities of the secondary schools in the two centuries covered by this study. The final chapter of the book (pp. 598-610) is labelled "Conclusion" and is an attempt to summarize the results of the study. Perhaps the reviewer may be allowed to say, what he has already implied, that he thinks there are statements in this chapter which the book itself does not support or which it even contradicts. This may or may not be so. But it is certainly true that this work deserves the serious attention of all who are interested in the development of American education.

To make it easy to use the book there is a very good index. And the bibliography fills more than seventy closely printed pages.

H. G. Good

Ohio State University

Lincoln, E. A., and Workman, L. L. *Testing and the Uses of Test Results* (New York: Macmillan Company, 1935), pp. XI + 317.

Since attention began to be given to the field of educational measurements in the training of teachers, there have been many attempts to produce a suitable text. The continued frequent appearance of new texts after a period of more than fifteen years of productivity indicates that those who deal with this field in the training of teachers are not satisfied with available texts. This condition is doubtless due in part to the apperance of new tests and to other developments in a relatively new field. But lack of agreement in regard to the purpose and content of a suitable text is probably a more potent cause.

Some authors have emphasized the construction of educational tests and the statistical techniques employed in handling the scores yielded by them. Other authors have provided us with descriptions of particular tests. Still others have emphasized the uses of educational tests. The text by Lincoln and Workman belongs in this group. Four uses are recognized: (1) survey, (2) experimentation, (3) individual diagnosis, and (4) drill. The topic of "preparation of new type testing materials" also receives attention and the appendix includes a "selected bibliography of diagnostic, drill and practice, instructional, and remedial tests" and "a dictionary of terms used in measurement and statistics."

The text is frankly "elementary and introductory." The authors have intentionally avoided technical details which they believe frighten many teachers away from educational measurements. The ex-

position is clear and effective. In many ways the authors give evidence of being mature students of the field. The volume will doubtless be favorably received by instructors offering introductory courses in educational measurements at the junior college level. It will, also, be valuable to teachers in service.

The reviewer's criticism of the volume is essentially a criticism of the author's purpose. He entertains doubts in regard to the wisdom of such an elementary treatment of educational measurements. To the reviewer it seems highly important that the faults and limitations be dealt with and to do this adequately requires more than an elementary treatise. Failure to point out the faults and limitations of measuring instruments contributes to a partial and probably biased understanding on the part of the reader. "The whole truth" is to be preferred to "half truths." The result of attempting an elementary treatment is illustrated in Chapter VII which is devoted to the use of standardized tests in educational experimentation. In reading this chapter, the reviewer did not note any statement to which he would raise serious objection, but the chapter as a whole presents a seriously erroneous picture of experimentation as a method of educational research. It is made to appear simple and certain of success if appropriate tests are employed. To be sure on page 112 the authors observe that "educational experimentation is not a simple matter." But this statement seems to be merely a fashionable gesture. Furthermore, the statement is so general that few readers will understand how complex and difficult controlled experimentation really is.

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LINCOLN, E. A., AND WORKMAN, L. L. *Testing and the Uses of Test Results* (New York: Macmillan Company, 1935), pp. XI + 317.

The purpose of this book is to make available to teachers the help to be derived from the development of the testing movement in the schools. An elementary and introductory style is followed. Difficulties of statistical method and a dictionary of statistical terms are deferred to an extended appendix, which also contains a selected bibliography and a list of available tests.

The beginner will find the book helpful for reading or reference. Tests are classified and explained, and their uses indicated. Separate sections show how tests are used for general survey and classification, for educational experimentation, for diagnosis, and for remedial teaching. These sections are presented simply, and to a considerable extent, from the viewpoints of the makers of the tests. Difficulties and probable complications are largely omitted. The theories of standardized tests are articulated with the modern view of the learning process and modern school practices.

Some may question the induction of the novice into the testing movement quite so simply. There are difficulties. Much what passes for standardized testing is not good; it is even detrimental. Should not the beginner be made conscious of these shortcomings, particularly when much of the quoted sections of tests represent indefensible procedures? Should not the teachers know that many of the standard tests are "of decidedly poor quality," and "ill-adapted to accomplish the objectives claimed for them." Many doubt the advisability of urging teachers to use tests unless they are prepared to use them critically and discriminatingly. The in-

student who uses this book as a text should supply the critical view-point from other sources. The authors, no doubt recognize the limitations of their work, and would subscribe to the criticism of this paragraph.

G. M. WILSON
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BRENNER, BENJAMIN. *Effect of Immediate and Delayed Praise Upon Learning and Recall.* Contributions to Education, No. 620 (New York: Bureau of Publications, Teachers College, Columbia University, 1934), pp. VII + 52.

Owing to the nature of the problem and the generally accepted technique for attacking it, this study, as its author recognizes, shows many of the shortcomings of its predecessors. These are reviewed so ably and so critically that the reader is led to believe the present effort is to be at least a milestone; yet the teacher and parent still await science's answer to the question of the relative effectiveness of praise and blame.

The author, in his reliance upon trends in lieu of statistical differences, opines that it will be necessary to discover separately "what will constitute the best motivation for spelling, or reading, or learning the multiplication table, etc." This may be true, but other things can be done first. One of them is for experimenters to abandon their repressed desire that praise will win. For example, in the present study, the children who were "blamed" immediately after their performance on the first trial expressed themselves as liking the experience sixteen percent more than those who were "praised" immediately. The "liking" of the praised group dropped off consistently in the successive trials, whereas that of the blamed group rose to 100 percent in the third trial, and in the fifth was still higher than in the first trial of those who were praised. But the author has this to say: "The IB [immediate blame] group has a larger percentage of favorable attitude in the second and third trials, but after that the attitude is quickly reversed."

If every one in a group of third graders liked an experience in which they were blamed, there must be some reason for it. Such a statement as "This is very poorly done. The class did very poor work today" would supposedly be less favorably received than, "This is splendid work. The class did very splendid work today." It is likely that there are some variables in the situation that are more potent than the standardized criticisms — enunciated with no respect for their truth.

Then, too, an implicit trust in the "twenty crucial words of third grade level of difficulty" as a measure to test the spelling ability of the children, and the assumption that the groups of ten words used in the successive trials (which the pupils looked at for four minutes and then wrote from memory) were "words which the children could read but as yet could not spell" seem an insufficient foundation for such a superstructure of statistical computation.

In the reviewer's opinion, the most significant finding of the study was the success of both methods of motivation at first, and their collapse after the novelty of the task began to wear off. Its weakness, like that of the studies which have preceded it, is that its technique buries the effects sought. Effective teachers are those who know how to motivate — not school subjects — but individual children.

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RESEARCH ABSTRACTS and BIBLIOGRAPHIES

Address all communications relative to research abstracts and bibliographies to A. S. Barr, University of Wisconsin, Madison, Wisconsin.

BULLETINS

BAMBERGER, FLORENCE E. *Reducing the Variability of Supervisors' Judgments: An Experimental Study.* The Johns Hopkins University Studies in Education, No. 23 (Baltimore: The Johns Hopkins Press, 1936), ix + 69 pp.

The author presents an experimental study of the variability of supervisors judgments in evaluating the teaching of learning situations from which she shows that the variability of these judgments can be reduced by the use of a carefully constructed observation chart.

BECKER, E. G. *Guidance at Work in a Large City High School.* Bulletin (New York: High School Division, Board of Education, 1935), 125 pp.

This bulletin constitutes the second annual report of the guidance department of the Samuel J. Tilden High School, Brooklyn, New York. It contains a discussion of general policies of administration, the program of individual guidance, major points of emphasis, and conclusion. There are eight appendices containing data of one sort or another.

BEERS, F. S., AND COX, H. M. *Educational and Vocational Guidance First Report, 1934-1935.* A report submitted to the Chancellor, the Board of Regents, and the Faculties of the University System of Georgia. 36 pp.

This first report contains a discussion of the questions: what are examinations for, characteristics of good examinations, and results of examinations prepared in survey courses?

BRIGGS, EUGENE S. *The Preparation of Secondary Teachers in Teachers Colleges for Guiding and Directing Extra-Class Activities.* Bulletin (Jefferson City: Missouri. State Dept. of Education, 1935), 115 pp.

The purposes of this study were: first, to discover the demand for secondary teachers prepared to guide and direct extra-class activities; second, to ascertain the provisions made for participation in, for study on, and for practice in guiding and directing extra-class activities in the State Teachers Colleges in the state of Missouri; third, to propose a program for preparing secondary teachers for guiding and directing these activities more efficiently. The author discusses the demand for teachers prepared to guide and direct extra-class activities, extra-class activities offered in State Teachers Colleges, provisions in State Teachers Colleges for the preparation of secondary teachers in guiding and directing extra-class activities, and a program for extra-class activities for the State Teachers College.

BRIGGS, THOMAS H., AND OTHERS. *Issues of Secondary Education:* A Report of the Committee on the Orientation of Secondary Education. Bulletin (Chicago: Dept. of Secondary-School Principals of the National Education Association, January, 1936), 372 pp.

This report contains a history of the committee's work and a discussion of the ten major issues in secondary education considered by this committee.

CARR, WILLIAM G. "Better Reading Instruction: A Survey of Research and Successful Practice," *Research Bulletin* of the National Education Association, Vol. XIII (November, 1935), pp. 273-325.

This bulletin contains chapters on laying the foundation in reading, a comparative analysis of teaching methods, the materials of instruction determining reading achievement, the administration and supervision of the reading program and a summary.

GRAY, J. L., AND MOSHINSKY, PEARL. *Ability and Opportunity in English Education.* Reprinted from *The Sociological Review,* XXVII (April, 1935) (London: Dept. of Social Biology, University of London, 1935), 161 pp.

From a study of the test scores made by some 10,000 individuals between the ages of nine and twelve years, six months. Upon the Otis advanced group intelligence tests (Form A) the authors conclude that in the whole school population in the vicinity of London more than fifty percent of the able pupils are without the opportunity of higher education.

HARTOG, SIR PHILIP, AND RHODES, E. C. *An Examination of Examinations* (London: Macmillan and Company, Limited, 1935), 81 pp.

This bulletin summarizes the results of a study of the reliability of school marks carried on in England and Scotland by a committee of English scholars in psychology and education. It was found, among other things, that when fourteen examiners remarked independently fifteen examination booklets which had all received moderate marks from the examining author by which they were furnished, these examiners between them, allotted over forty different marks to these examination booklets. It was found further, that when these examiners remarked once more the same papers after intervals of from twelve to nineteen months they changed their minds in 92 cases out of a total of 210.

HEFFERNAN, HELEN. *The Elementary School Principalship in California.* Bulletin (Sacramento, California: State Dept. of Education, 1934), 136 pp.

The purpose of this study is to present the more important facts regarding the status of the elementary school principal in the state of California: previous studies, kinds of elementary school principalships, personal and economic factors, academic and professional training, certification, educational experience, clerical assistance, administrative and supervisory responsibilities, community relationships, and appendices. Bibliography.

HEPNER, W. R., AND ORION, W. H. *Special Activities in Physical Education for High School and Adult Groups.* Bulletin (Sacramento, California: State Dept. of Education, 1935), viii + 117 pp.

This bulletin contains suggested programs of activities in the field of physical education prepared to help principals and teachers in the organization of physical education programs for special groups of high school pupils and adults.

JONES, ARTHUR J., AND OTHERS. *Suggestions for Developing Guidance Practices in Secondary Schools: A Handbook for Guidance Teachers and Coun-*

sclors. Bulletin No. 13. Pennsylvania Curriculum Studies (Harrisburg: Dept. of Public Instruction, 1935), 110 pp.

This bulletin represents the coöperative effort of a great many people and discusses the program of guidance for the state of Pennsylvania: guidance practices in secondary schools, purposes of the guidance program, features of the schools through which guidance is exercised: school subjects, student activities, pupil diagnosis, counseling service, etc., coördinating agencies, teacher training, or preparation of guidance workers, the evaluation of the guidance program, and occupational research. Bibliography.

LEIGHTON, R. W. *Studies of Laboratory Methods of Teaching.* Bulletin. Part I. pp. 1-129.

SEASHORE, ROBERT H. *Qualitative Aspects in the Improvement of Science Teaching.* Part II, Bulletin (Oregon: Committee on College Training, University of Oregon, March, 1935), pp. 130-184.

This bulletin contains the reports of two studies: one of the laboratory method of teaching; and the other, of the qualitative aspects in the Improvement of Science Teaching. The first contains a report of certain experiments performed at the University of Oregon in evaluation of laboratory methods of teaching in Science; and the second, discussion of the determination of course objectives, the informational content of scientific courses, the importance of the scientific method, methods of presentation from the standpoint of science teachers, motivation, examinations, and suggestions for further work. Bibliography.

MANUEL, H. T. *Spanish and English Editions of the Stanford-Binet in Relation to the Abilities of Mexican Children.* Bulletin, No. 3532 (Austin: University of Texas, 1935), 63 pp.

The purpose of this monograph is to report a study of a Spanish and English Edition of the Stanford revision of the Binet-Simon Intelligence Scale in relation to the abilities of Mexican children. The author discusses age and grade, mental ages and intelligence quotients, practice effect, intelligence quotients of subgroups, correlations of Spanish and English Editions, intelligence and school success, socio-economic status, item study, and vocabulary.

NOLL, VICTOR H. *The Habit of Scientific Thinking.* Bulletin (New York: Bureau of Publications, Teachers College, Columbia University, 1935), 27 pp.

This is a handbook for teachers to accompany the Noll test of Scientific Thinking.

PETERS, CHARLES C. *Abstracts of Studies in Education at The Pennsylvania State College.* Part V (State College: Pennsylvania, School of Education, Pennsylvania State College, 1935), 59 pp.

This is the fifth volume of abstracts of Penn State Studies in Education. This volume contains a summary of twenty-six investigations.

PHILLIPS, WENDELL S. *An Analysis of Certain Characteristics of Active and Prospective Teachers.* Bulletin (Nashville, Tennessee: George Peabody College for Teachers, 1935), 51 pp.

After presenting a statement of the problem and a review of previous investigations the author discusses the reliability and validity of the measuring techniques employed in his investigation, the analysis of the data collected with a summary and recommendation. Bibliography.

RUSSELL, H. H., AND OTHERS. *Geographic Education in Elementary and Junior High Schools.* Bulletin No. 91. Penn-

sylvania Curriculum Studies (Harrisburg: Dept. of Public Instruction, 1935), 183 pp.

The materials presented in this bulletin represent the work of a large number of individuals. It is not offered as a course of study but as materials out of which courses of study may be constructed. The bulletin offers suggestions for the development of units, a survey of the year's work, and a bibliography for the fourth, fifth, sixth, seventh and eighth years in school. There are three appendixes containing materials on visual aids, geography tests, and a directory of publishers.

SMITH, HENRY L., AND OTHERS. *Twenty-Second Annual Conference on Educational Measurements.* Bulletin of the School of Education, Indiana University (Bloomington, Indiana: Bureau of Coöperative Research, December, 1935), pp. 97.

This bulletin contains papers on out-of-line and unadjusted pupils in Monroe County, the Monroe County school survey, measurement in the supervision and improvement of teaching, measuring the efficiency of teaching first year algebra, educational program of the CCC work camps of Indiana, well-planned first instruction vs. diagnosis in the supervision of instruction, higher education and the social order, values transcending evaluation, and measuring the excellence of institutions of higher education.

STODDARD, GEORGE D., AND OTHERS. Mental and Physical Development. *Review of Educational Research.* Volume VI (February, 1936), pp. 1-152.

The authors discuss the development of intelligence and motor control in infancy, the mental development from two to twelve years, motor development from two years to maturity, physical growth from birth to maturity, mental development in adolescence, and the relationship in physical and mental development. Bibliography.

STRANG, RUTH. *Improvement of Reading in Secondary Schools.* Bulletin (New York: Bureau of Publications, Teachers College, Columbia University, 1935), 20 pp.

A teacher's manual for the study type of reading exercises offering general suggestions for the improvement of reading in secondary schools, descriptions of the study type of reading exercises for which the manual was constructed, the use of these exercises in the improvement of reading, and a scoring key.

WEST, MICHAEL. *Definition Vocabulary.* Bulletin No. 4. Dept. of Educational Research (Toronto: University of Toronto, 1935), 105 pp.

This bulletin discusses the problem of writing in English an English dictionary for foreigners: choice of vocabulary, definition of words, prefixes and suffixes, etc.

ADMINISTRATION AND SUPERVISION

ENGELHART, MAX D., AND TUCKER, L. R. "Traits Related to Good and Poor Teaching," *The School Review.* Volume XLIV, January, 1936.

The authors working with a number of other persons prepared a list of the significant factors in teaching success. This list was then presented to two hundred and twenty-four high school pupils with the request that they underline the trait that best described the best teacher that they have ever had and the traits that best described the poorest teacher that they had ever had. The traits presenting

the highest coefficients of correlation were good temperament, clear explanation, respect for the opinions of others, sincerity, impartiality, fairness, etc.

HILL, GEORGE E. "The Report Card in Present Practice," *Educational Method.* Volume XV, December, 1935.

The author presents a statistical analysis of present day report cards, discussing the general form and organization of report cards, the marking systems employed, the marking of character traits, and other similar data pertaining to present practices.

SHANNER, CHARLES R. "Regulations Pertaining to Health, Hygiene, and Safety in City School Systems," *The Elementary School Journal.* Volume XXXVI, December, 1935.

The author presents an analysis of 1467 regulations pertaining to health, hygiene, and safety found in the enactment of regulations of boards of education in one hundred and thirty cities.

METHODS

FINCK, EDGAR M. "Relation of Ability in Reading to Success in Other Subjects," *The Elementary School Journal.* Volume XXXVI, December, 1935.

From an experimental study involving the work of twenty-one pupils the author finds that improvement in ability to read is accompanied by improved achievements in those school subjects which involve a great amount of reading.

HILL, ARTHUR S. "A Statistical Analysis of Significant Factors in Pupil Maladjustment," *The Journal of Educational Sociology.* December, 1935.

The author presents a list of fifty-three items which he considers significant factors in pupil maladjustment based upon a study of adjusted and maladjusted pupils.

TRIMBLE, OTIS C., AND ASPERGER, DOROTHY H. "The Recognition Spans of Good and Poor Readers: A Comparative Study." *The Journal of Applied Psychology.* Volume XIX, December, 1935.

The author presents data to indicate that good and poor readers can be distinguished on either the basis of phrase-reaction time or the recognition span.

CURRICULUM

WISE, CARL T. "The Spelling Difficulty of 1,102 Words Found in Twenty Spellers," *The Elementary School Journal.* Volume XXXVI, December, 1935.

Of a total of 13,641 different words found in twenty spellers, 3,630 words were found to be common to eleven or more of these books. There are 1,102 words found in the list of 3,630 words not found in previous spelling scales. This article presents an analysis of the difficulty of these 1,102 words.

MEASUREMENTS, STATISTICS, AND SCIENTIFIC TECHNIQUES

SMITH, FRANCIS F. "The Direct Validation of Questionnaire Data," *Educational Administration and Supervision.* Volume XXI, November, 1935.

From a study of the validity of various sorts of questionnaire data the author concludes that the individual response taken by itself is of questionable value. Individuals differ in their ability to furnish valid data. The validity of responses involving judgment and opinion usually seem to be lower than the responses to requests for factual data.

RESEARCH NEWS and COMMUNICATIONS

Address all research news and communications to Carter V. Good, Teachers College, University of Cincinnati, Cincinnati, Ohio.

Yearbook for 1936.—The Thirty-Fifth Yearbook of the National Society for the Study of Education comprises two independent volumes. Part I, entitled "The Grouping of Pupils," has been prepared by a committee of the Society composed of W. W. Coxe, State Education Department, Albany, New York (Chairman); H. J. Baker, Detroit Public Schools; R. O. Billett, Boston University; P. A. Boyer, Philadelphia Public Schools; W. L. Connor, Cleveland Public Schools; and A. H. Turney, University of Kansas, assisted by eleven other persons, well known in university or public-school circles. The material is organized around the following main sections: the importance of grouping in school administration; the philosophical, sociological, and psychological principles underlying theories of grouping; the interrelations between grouping and curriculum and method; how grouping is administered in certain selected school systems; and the evaluation of grouping. The Committee has gone to some pains to solicit contributions representing typical variant and even contradictory views, so that the volume is decidedly thought-provoking as well as informative.

Part II, entitled "Music Education," has been prepared by a committee of the Society composed of W. L. Uhl, University of Washington (Chairman); F. L. Bacon, Township High School, Evanston, Illinois; J. W. Beattie, Northwestern University; P. W. Dykema, Columbia University; R. V. Morgan, Cleveland Public Schools; J. L. Mursell, Columbia University; and Anne E. Pierce, State University of Iowa, assisted by twelve professors, directors, or supervisors of music. The general themes discussed pertain to the principles underlying music education; its place in a system of education; musical activities in the school, like singing, ear-training, reading music; and numerous classroom and administrative problems, like selecting materials, equipping rooms, programs for rural schools, music outside the school, training teachers of music, and so forth. In view of the quickened interest in training in art as an avocation and a recreatory phase of home and community life, this book will be examined profitably by all administrators; it will be appreciatively welcomed by all musicians, especially by musicians who are striving to see public-school music assume the significant place it should fill in education.

The discussion of general principles of music education is in accord with other recent literature on teaching. It emphasizes the importance of music not only for its own sake but also for its great social value. The longest section of the yearbook is devoted to eight different music activities. Two of these, singing and the playing of musical instruments, are found in practically all schools. Definite suggestions are given about each one of them; these suggestions include grade standards as well as points that are important for music teachers and administrators to observe. Of the other six activi-

ties, some are taught in almost all schools that offer any work in music, although only incidental training is given in many of them, at least in certain grades. Strong emphasis is placed on the importance throughout the school course of ear training and training in rhythm activities and listening. The section on reading activities includes a discussion of the importance, placement, and procedures that are used in various methods of teaching pupils to read music. Creative activities, which are neglected in many schools, are given a large place in all grades. Definite suggestions are given about the ways of inducing pupils to express themselves musically and to improve their ability in such expression from grade to grade. Music theory is presented chiefly as a high school subject, although incidental training is advised for the elementary school. The section on materials for music education is particularly valuable. It contains criteria for the selection of materials and also a discussion of each of these criteria. The discussion of a program for activities outside the school describes in detail certain activities and is especially concerned with the continuance of music that is started in school. The significant relationships of music are distinguished from incidental relationships. The measurement of achievement in music is discussed with reference to published tests, although greater emphasis is given to the use of somewhat informal tests that can be prepared by the teacher. The section on the selection and training of teachers recognizes the importance of the teacher's ability to use her music equipment as well as the necessity of the equipment itself. School administrators will probably find the discussion of music rooms and equipment one of the most practical, particularly if they are constructing or remodeling school buildings. The present interest of many rural localities in music led to the inclusion of a section that is fairly complete in itself, on music in rural schools. Throughout the yearbook there has been an attempt to present various points of view and to suggest diversified activities and materials for pupils.

There probably will be in 1937 and 1938 a yearbook on "International Understanding and the Public School Curriculum," under the chairmanship of I. L. Kandel of Columbia University, and a yearbook on "The Teaching of Reading," under the chairmanship of W. S. Gray of the University of Chicago. This second yearbook, it is hoped, will make an important contribution by bringing down to the present date the best information that we have secured with respect to reading since the publication of the important Twenty-Fourth Yearbook on that topic.

Social Studies Yearbook. — The 1936 Yearbook of the National Council for the Social Studies bears the title, *The Elements of the Social Studies Program.* It has been prepared under the editorship of R. O. Hughes, Assistant Director of Curriculum Study in the Pittsburgh Public Schools and at present First Vice President of the National Council for the Social Studies, who provided the facts here reported. Its publication was expected about January 15, 1936. Twelve contributors, in addition to the editor, have had a part in the preparation of the book. The list of chapter headings with the authors of the respective chapters follows:

I. The Social Studies and Their Scope, Daniel C. Knowlton, New York University.

II. Some Basic Considerations, R. O. Hughes, Pittsburgh Public Schools.

III. American History in the Social Studies Program, Howard E. Wilson, Harvard University.

IV. World History in the Social Studies Program, Alice N. Gibbons, East High School, Rochester, N. Y.

V. Geography in the Social Studies Program, DeForest Stull, Columbia University.

VI. Civics in the Social Studies Program, Roscoe Lewis Ashley, Pasadena Junior College.

VII. Economics in the Social Studies Program, O. W. Stephenson, University of Michigan.

VIII. Sociology in the Social Studies Program, Ruth Wood Gavian, Brewster, Mass.

IX. Problems Courses in the Social Studies Program, J. Lynn Barnard, Ursinus College.

X. Local and State History in the Social Studies Program, R. M. Tryon, University of Chicago.

XI. The Consideration of Current Events and Current Questions, J. Madison Gathany and Russell E. Fraser, East Orange High School, East Orange, N. J.

XII. Activity Program in Its Relation to the Social Studies, Burton P. Fowler, Cecile M. Buckles, Tower Hill School, Wilmington, Del., and Richard M. Perdew, Dartmouth College.

XIII. Correlation between the Social Studies and Other Subjects, Howard C. Hill and Harold A. Anderson, University of Chicago.

XIV. Conclusions and Proposals, R. O. Hughes, Pittsburgh Public Schools.

The purpose of the book is to survey the influences that have contributed and ought to contribute to the formulation of a social studies program, and to take up the various subject elements which commonly constitute the major portion of the program through the elementary and the high school. Consideration is also given to related interests and activities which may not be given a distinct and separate assignment in the program, but which, nevertheless, contribute vitally toward making it an effective force for intelligent citizenship. Most of the authors take into account in the treatment of their subject both content material and method of presentation. It has been the hope of the editor that the book might effectively complement the 1936 Yearbook of the Department of Superintendence, which deals with the social studies, and every effort has been made to avoid duplication of that publication.

This is the sixth in the series of yearbooks which the National Council began to publish in 1931. It is the custom of the Council to assign the preparation of the yearbook to the person who in any particular year has been chosen First Vice President of the organization.

Recent Developments in Science Teaching. — The monograph of the National Survey of Secondary Education entitled *Instruction in Science*[1] was published in 1932. At its February meeting in 1932, the Committee on the Teaching of Science of the National Society for the Study of Education presented its report entitled *A Program for Teaching Science*.[2] These two reports, although published simultaneously, were prepared independently. The points emphasized in them are distinctly different, but, in general features,

[1] Wilbur L. Beauchamp, *Instruction in Science*. Bulletin 1932, No. 17, National Survey of Secondary Education Monograph 22 (Washington: Office of Education, 1933), Pp. vi + 63.

[2] *A Program for Teaching Science* Thirty-First Yearbook of the National Society for the Study of Education, Part I (Bloomington, Illinois: Public School Publishing Co., 1932), Pp. xii + 364.

the two reports are supplementary and in no important particulars are they conflicting.

The National Survey Report is based upon an analysis of practices. Data for the analysis were obtained chiefly from courses of study in science and from school visitation. From both these sources came the conclusion that efforts in instruction in science in secondary schools were uncoördinated. The surveyor's examination of courses of study "indicates that the majority of courses were formulated by committees representing each of the different fields of science; that is, the courses in general science were made by teachers of general science, courses in biology were made by teachers of biology, and so on. No reference was found which might indicate that the course was formulated by a single committee representing the whole field of science." The tendency was to regard each of the sciences as a special field, rather than as part of "a sequence of subjects having a common core, with overlapping aims, methods, and psychology of learning."

The Committee of the National Society for the Study of Education recognized the need for closer coördination of the work of science teachers and proposed as a major feature of its Report a program of continuous instruction in science through the grades of the elementary and secondary schools and into the colleges. Another feature of the Report is a program for the education of teachers. The proposal was based upon the Committee's interpretation of educational research and of points of view in education that have received general recognition in planning the program of public education.

This Committee took a vigorous position favoring instruction in science for its contribution to understanding of and ability to deal with the influences of science on the life of today. The method suggested for associating the teaching of science with issues in modern life may be briefly summarized. The aim of education stated in the Report is, "life enrichment through participation in a democratic social order." It was suggested that the program for teaching science be associated with the aim of education through broad generalizations selected for their relations to understandings normally associated with life in our social order.

In at least three important respects this was a new approach to science teaching. First, with emphasis on continuous instruction in science, it furnishes a basis for coöperative effort among science teachers on all levels, including elementary and secondary schools and colleges. Second, with its emphasis on generalizations and on methods of study, habits, ideals, and attitudes it brought into sharp contrast the too common error of teaching facts more or less in isolation. Third, with emphasis on the social significance of science, the proposal suggests a shift in organization from one which is designed to give a comprehensive overview of special subjects to an organization set up to use content from the special sciences, selected for its contributions to understandings and abilities which are useful in unspecialized activities. These three features in the Report are supported by the Committee's interpretation of current educational theory.

The major features of this Report have had general acceptance. Emphasis on understanding of life relations had led to selection of instructional materials from areas defined by broad generalizations directly related to life. Following this emphasis there has come a marked change in the science content used in the elementary school. In the junior high school there has been some change in content and a marked change in organization. In the senior high school and in the college,

changes in content and in organization are in progress. In all these, the tendency is toward larger provision for instruction in science and toward greater emphasis on social significance of scientific achievements and on scientific methods and attitudes.

Two major lines of research have been stimulated by these reports and recommendations. For purpose of reference these may be called research in curriculum and research in the process of learning. Curriculum research is directed toward the definition of science content which shall be valid in general education for its contribution to understanding of and ability to deal with issues in human relations. Research in learning is carried on in an effort to gain a clearer understanding of the abilities of children of different levels of maturity to profit from educational experiences suggested by theoretical considerations as appropriate for them. Work now in progress includes studies of ability to achieve understanding and to do critical thinking. Also, it includes the effects of educational experiences on overt behavior and on the development of specific and generalized attitudes, interests, and appreciations.

In some measure these reports on science teaching have influenced thinking in other fields, particularly in mathematics and social studies. It seems not unreasonable to think that the plan for organization of content about broad generalizations, valid in education because of their ramifications into human relations, may prove acceptable as a basis for coöperative work on the part of all teachers whose primary interests are in general education. The main features in the Report of the National Society for the Study of Education are accepted with favor, since the plan suggests procedures whereby specialists in education and specialists in the various academic branches may work together to produce an enrichment of educational experiences.

In the interval since the publication of these reports there have been marked changes in practices in science teaching. It seems certain that the immediate future will see even more striking changes, particularly in the senior high school and the college. Next steps will include development of techniques for evaluation of the new educational practices and further application of results from curriculum research and from research in learning. The time is approaching when there will be need for another "Survey of Instruction in Science" and when it will be possible to present a much refined "Program for Teaching Science."

This statement was provided by S. R. Powers of Columbia University.

Report of the Survey on Teacher Education.—During the past year the final volumes of the report of the National Survey of the Education of Teachers were distributed by the United States Office of Education and are now obtainable from the Superintendent of Documents, Washington, D. C. This survey, one of the series of nationwide studies sponsored by the United States Office of Education, was authorized by the 71st Congress to study "the qualifications of teachers in the public schools, the supply of available teachers, the facilities available and needed for teacher training including courses of study and methods of teaching."

State and city superintendents of schools and presidents of institutions of higher education were asked to submit their most pressing problems in the education of teachers and from the resulting list the directors and the Board of Con-

sultants[1] selected the problems to be studied. The selections were naturally affected by the conditions of the enabling act, the limitations of time and money, and the availability of data. The scope of the Survey may best be presented by listing with brief comments the studies contained in each of the six volumes of the final report.

Volume I is a bibliography of 1,297 selected, annotated, classified, and indexed references on the education of teachers (Betts, G. S., Frazier, B. W., and Gamble, G. C.).

Volume II contains three studies of the teaching personnel in the United States. Part 1 gives a description of the teachers in the public schools of the United States based on data from nearly half a million replies on such matters as age, educational preparation, experience, teaching load, and factors affecting supply and demand among teachers (Evenden, E. S., and Gamble, G. C.). Part 2 is an analysis of the social, economic, and educational background of 21,332 students (prospective teachers) in a selected group of teachers colleges and liberal arts colleges in the central section of the United States (Blue, H. G.). Part 3 contains personnel data about faculty members of 604 institutions of higher education in which teachers are prepared. These data are arranged by type of institution and show similarities and differences in such matters as preparation, experience, service load, and professional advancement (Evenden, E. S., and Gamble, G. C.).

Volume III is devoted to an analysis of curricula for the education of teachers. This was the field of teacher-education in which the greatest number of problems were listed and its analysis is one of the most extensive and important phases of the Survey. The curricula of the normal schools and teachers colleges were studied by Earle U. Rugg and those of the junior college, and colleges and universities by W. E. Peik, and their reports are given in Parts 1, 2 and 3. Part 4 is a description of the practice-teaching facilities of the different types of institutions (Foster, Frank K.). Part 5 shows the status of summer sessions in the pre-service and in-service education of teachers (Foster, F. K.). Part 6 reveals the rapid development of graduate work and professional degrees in the education of teachers (John, W. C.). Part 7 contrasts the educational, philosophical, and sociological theories held by the staff members of different types of institutions in which teachers are prepared (Raup, R. B.).

Volume IV contains data on the education of Negro teachers in the 17 States and the District of Columbia in which separate school systems are maintained for Negroes. It contains studies of the teaching personnel, of the faculty members, and of the curricula for teachers similar to those for white teachers given in parts of Volumes II and III, but from a less satisfactory sampling of the group. This study was made by Ambrose Caliver.

Volume V contains eight special survey studies and the digests of eight additional coöperative studies made as parts of the total survey program. The special investigations reported are: The history of the education of teachers in the United States (Frazier, B. W.); an analysis of the studies of teaching merit and their implications for the education of teachers (Betts, G. L.); provisions for the welfare of students (prospective teachers) in institutions of higher education (Frazier, B. W., and Greenleaf, W. J.);

[1] The Board of Consultants consisted of the following men: William C. Bagley, W. W. Charters, George W. Frasier, William S. Gray, M. E. Haggerty, Henry W. Holmes, William W. Kemp, W. P. Morgan, Shelton Phelps, D. B. Waldo, Payson Smith, and Guy S. Snavely.

a comparison of the library facilities of teachers colleges with those of liberal arts colleges (Waples, D.); a study of the reading interests of teachers, prospective teachers and other groups (Waples, D.); the in-service education of teachers (Dearborn, N. H.); the preparation of teachers for rural schools (Carney, Mabel); and a description of the standards and methods of educating teachers (elementary and secondary) in England, France, Germany, and Sweden (Alexander, T.).

Volume VI is devoted to a summary and interpretation in which the findings of the various parts of the Survey were used in the detailed discussion of the three important problems: (1) how can the level of the education of American teachers be raised (quantity or amount of preparation); (2) how can the preparation of American teachers be made more distinctly professional (quality or appropriateness); and (3) how can a better adjustment between supply and demand be brought about in the several States (professional security). The last chapter of this volume contains a list of some of the principles which should control the education of teachers in the United States and also a list of some of the more important and pressing things to be done in connection with the development of State programs for the education of teachers.

Each volume (with the exception of the first) will repay study by individuals or groups interested in the education of teachers. These volumes contain data revealing the present status as well as the present practices and policies of teacher-education; they reveal existing conflicts and controversial issues; they suggest problems which should be given further study and indicate methods by which the problems may be attacked; and they make proposals for the education of teachers which, if approved, should be tried under conditions making more nearly accurate evaluation possible.

This statement was prepared by E. S. Evenden of Columbia University, Associate Director of the Survey.

Society for Research in Child Development.—This Society had its inception at a meeting held in Chicago in June, 1933, under the auspices of the Child Development Committee of the Division of Anthropology and Psychology in the National Research Council. Here were gathered, by invitation, representative research workers in fields which centered in, or were allied to, the scientific study of the child, such as psychology, sociology, education, psychiatry, physical growth, nutrition, and pediatrics. The purpose of this meeting was to consider the advisability of forming a new organization which would cut across scientific branches and encourage the professional intermingling of persons interested in various aspects of child growth. After unhurried discussion and conference, and in full knowledge of the general aversion to "just another organization with dues, committees and conventions," it was resolved to go ahead with the proposed plans for a society which, it was hoped, would offer something unique and helpful to its participating members.

The aims of the Society can best be understood by quoting from its constitution which was adopted at the first biennial conference, at Washington, D. C., November, 1934:

"The purposes of the Society for Research in Child Development shall be the furtherance of research in child development, by means of meetings, conferences, publications and the distribution of research information; the stimulation of research in new localities and new fields of knowledge; and the coördination of research and its application by the pro-

vision of opportunities for mutual acquaintance among those working in different localities and disciplines."

There are at present two classes of active membership in the Society, fellows and members. "Fellows of the Society shall be persons who are actively engaged in research within the field of child development or any of the basic sciences relating thereto, and who have demonstrated their capacity for research by scientific publication through appropriate channels. . . . Members of the Society shall be persons who by virtue of activity in a scientific or practical field relating to child development, are, in the judgment of the governing council, qualified for admission to the Society."

The 1934 Washington meeting, referred to above, was attended by about 150 persons, representing the major scientific interests within the Society. Except for one or two general sessions given over to symposiums and problems of interfield coördination, there were no "audiences;" rather, each person was expected to contribute something to the question at hand. At this conference some of the proposed activities of the Society took more definite shape. They may be summarized as follows:

1. The holding of biennial conferences devoted especially to sequential and multifield studies of the child.

2. The holding of regional conferences in the odd years, similar in plan to the national conference. Thus far such conferences have been held at the University of California and the University of Chicago.

3. The publication of a monograph series, number 1, entitled "The Development of Motor Abilities During the First Three Years," by Nancy Bayley, has already appeared.

4. The organization of field committees along functional lines as opposed to narrower, conventional designations. Typical examples are committees on Adjustment and Personality, Community Health, Mental Growth, Nutrition, and Special Developmental Periods.

5. The establishment of a Washington office for centering the Society's activities. This is in the National Research Council building.

6. The gradual assumption of certain of the publication, conference, and coördination responsibilities at present assigned to the Child Development Committee of the National Research Council.

At the present time the membership numbers about three hundred. No attempt is being made to enlarge this membership indiscriminately, for a prime purpose is to restrict it to individuals who not only show an ongoing desire to do research, but feel the need for the kind of professional cross-fertilization which the Society provides.

The Society is governed by a Council comprised, at present, of the following directors: R. S. Woodworth, Chairman (1934, 1935), G. D. Stoddard, Chairman (1936, 1937), R. E. Scammon, L. K. Frank, E. V. McCollum, R. S. Lynd, H. F. Helmholz, Adolf Meyer, and C. E. Palmer, Secretary-Treasurer.

Throughout this formative period the General Education Board is providing the necessary financial support.

This statement was prepared by G. D. Stoddard of the University of Iowa.

Educational Policies Commission.—The National Education Association and the Department of Superintendence announce the appointment of an Educational Policies Commission for a five-year period, to consist of fifteen appointed and ex-officio members plus two advisory members. The members are Cornelia S. Adair, Richmond, Virginia Schools; Lotus D. Coffman, University of Minnesota;

George S. Counts, Columbia University; J. B. Edmonson, University of Michigan; Frederick M. Hunter, University of Oregon; Charles H. Judd, University of Chicago; John K. Norton, Columbia University; John A. Sexon, Pasadena, California Schools; Payson Smith, former Massachusetts Commissioner of Education; George D. Strayer, Columbia University; Willis A. Sutton, Atlanta, Georgia Schools; J. W. Studebaker, U. S. Office of Education; George F. Zook, American Council on Education; Agnes Samuelson, Iowa State Superintendent of Public Instruction; Willard E. Givens, Executive Secretary of the N.E.A.; A. J. Stoddard, Providence, Rhode Island Schools; and S. D. Shankland, Executive Secretary of the Department of Superintendence. An account of the activities of the Commission may be found in the December number of the *Journal of the N.E.A.*

Commission on Human Relations.—The Progressive Education Association has named a Commission on Human Relations to further the Association's program in the study of youth. The twofold task of this commission includes a study of the human problems faced by young people today and the preparation of relevant reading materials, source books, and suggested teaching techniques to be employed in the education of those of high school and college age.

The Commission on Human Relations has taken over and will extend the work of a group of well-known experts who, a year ago, gathered a large amount of significant materials dealing with human relations from their respective fields of psychology, biology, anthropology, sociology, mental hygiene, sex research, child development, and literature. The significance of these source materials, and those extended materials to be prepared, is derived from the fact that they deal with an area of problems long neglected or avoided in the education of the adolescent. Youth, given a hearing, bitterly denounces the education which gives him no insight into his own behavior, the behavior of those around him, or into his emerging and constantly more difficult sex problems. Of even more significance, though not so evident to youth, the school also fails to give him awarenesses of and insights into the culture which impinges on his every decision.

Therefore, the Commission, disregarding such subject matter divisions as now prevail in high schools and colleges, will start from the needs, interests, and problems of youth. Around such centers, materials from special fields of knowledge will be brought together in such ways that they illuminate human problems and reinforce understanding of human behavior and the impinging culture.

Several specific projects are under way. Research has shown that adolescents are often intensely concerned about their problems as members of families and as potential founders of families. Therefore, the first project of the Commission will be a book for adolescents about youth and the family. Typical comments and queries of young people about the family will determine the nature of the book. Much attention will be given to the changing roles of the various family members. Anthropology, history, sociology, economics, psychology, biology, literature, and other fields will be drawn upon for the building of the book.

This will be followed by another book for adolescents dealing with the eternal question, "Am I normal?" The growth cycle in physical, mental, social, and emotional development will be pictured. Again, the queries of youth will serve as the nuclei for discussion. A third book of this series is planned, though it may not be ready for publication as soon as

the others. It will deal with answers to the question, "How do people become what they are?" The individual, his impact with the culture, and his behavior techniques will be discussed in this book.

In addition to the three books written for young people, there will be accompanying source materials for teachers, counsellors, parents, or other adults. Also, for those schools whose programs do not allow the introduction of separate courses in human relations, a series of suggestions for teaching human relationships through literature will be prepared. Some of these products will be ready for experimental use during the school year of 1936-1937.

Members of the Commission are: Alice V. Keliher, Chairman, formerly Instructor in the Institute of Human Relations, Yale University, and Supervisor of Elementary Education, Hartford, Connecticut; Willard W. Beatty, Superintendent of Schools, Bronxville, N. Y., and President of the Progressive Education Association; Earl S. Goudey, formerly Science Instructor, Bronxville High School; Leo Huberman, author of *We the People* and formerly Assistant Editor of *Scholastic*; Louise Rosenblatt, Instructor in English (on leave), Barnard College, Columbia University, and formerly fellow in Comparative Literature, University of Paris; Robert Wunsch, Professor of English and Dramatics, Black Mountain College; Edna Albers, Research Assistant; and Elizabeth Vogler, Executive Secretary.

Union List of Periodicals in Ohio.—About two years ago, conscious of the growing need for some form of coöperation between college libraries of the state in making their resources known and available to other colleges, the College and University Section of the Ohio Library Association appointed a committee to study possible means. This committee, with Guy R. Lyle, Librarian at Antioch College, Yellow Springs, as chairman, decided that a union list of the periodical holdings of the various college and university libraries of the state, not already represented in the *Union List of Serials*, might be the first tool to be attempted. All of the college libraries of the state were asked to coöperate; twenty-six felt that it would be possible for them to do so. Accordingly, their librarians sent in to Mr. Lyle reports of the periodical material which these libraries contain. For the sake of uniformity, these entries were compared with those in the *Union List of Serials*, and it was discovered that some of the older and smaller college libraries contained sets not entered as being in the larger libraries of the country.

The reports of holdings are all in and entered, and the result is a list which should be a valuable tool for use in interlibrary loans. The state association agreed, at its 1935 annual meeting, to finance the publication of this regional list. Before sending it to be lithoprinted, an attempt is being made to obtain some estimate of the number of copies which can be sold, since the price per copy will materially decrease if a large number are ordered. If orders for no more than a hundred copies are received the price per copy will not exceed $4.00, but if twice that number are ordered the price will be reduced almost fifty percent. Inquiries concerning the list may be sent to Miss Gertrude Wulfekoetter, University of Cincinnati Library, the present chairman of the committee.